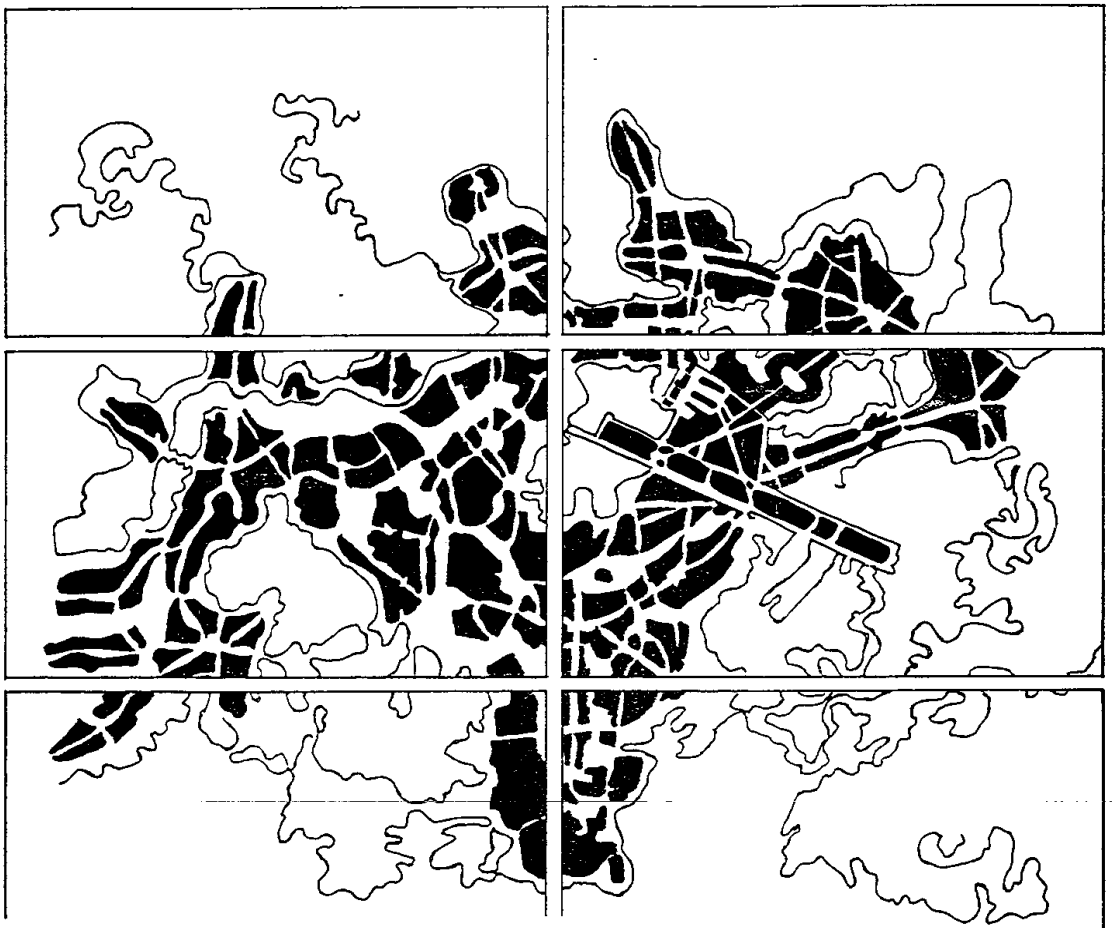
PLANNING AIRBASES FOR COMBAT EFFECTIVENESS

Base Comprehensive Planning Handbook



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Base Comprehensive Planning Handbook

JANUARY 1989

HQ USAF/LEEDX

Acknowledgments

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PLANNING AIRBASES FOR COMBAT EFFECTIVENESS

This handbook provides guidance for Air Force personnel responsible for base comprehensive planning, and for consulting firms that prepare base comprehensive plans (BCPs) in accordance with AFR 86-4. The handbook describes concepts and initiatives to incorporate planning for combat effectiveness in the BCP, and outlines a process for developing the Contingency Plan Component of the BCP. A sample Contingency Plan Component and a statement of work for preparing the component also are included. The handbook applies to personnel at all Air Force installations, facilities, and activities. Comments should be sent to HQ USAF/LEEDS, Washington, DC 20332-5000.

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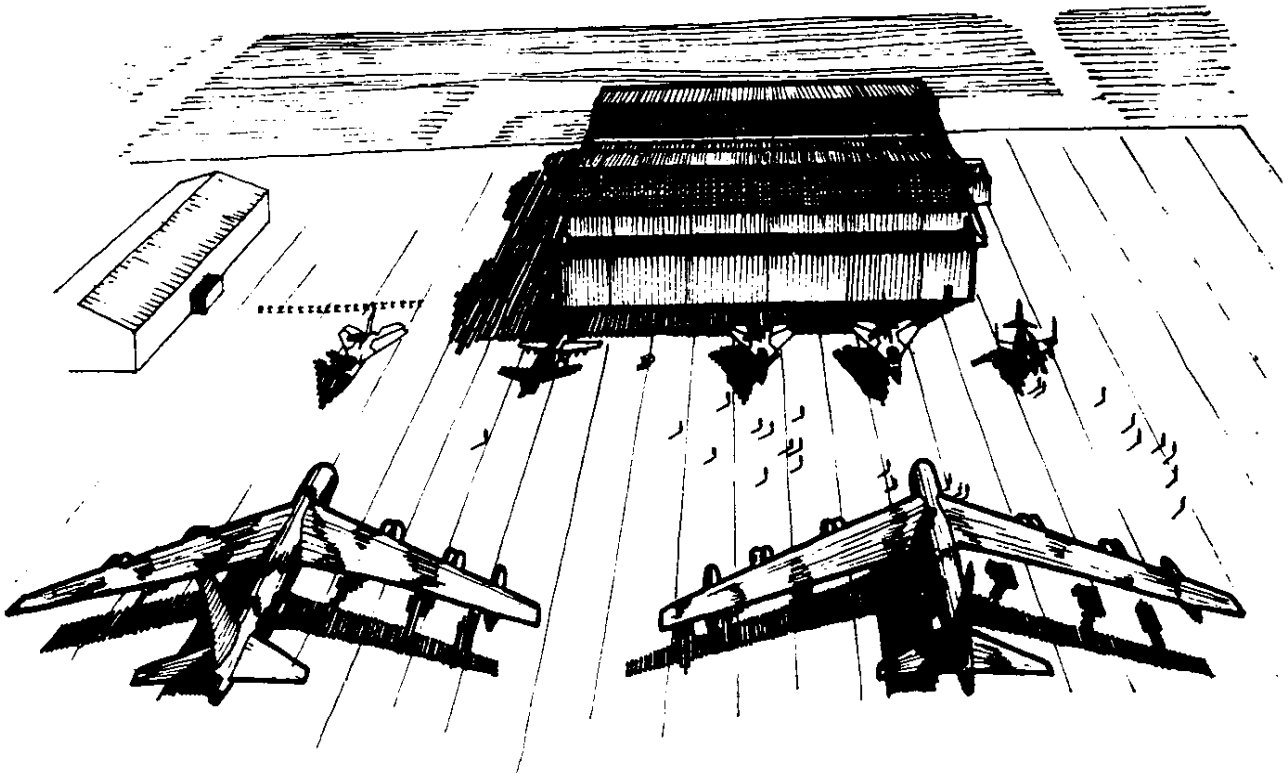
OPR: LEEDX (Kenneth L. Robertson)

FIGURES (continued)

TABLE

ATTACHMENTS

Bases are the critical juncture at
which aerospace power is most dependent.
For it is at the bases that resources
are concentrated in order to manifest combat
power (AFM 1-10, Combat Support Doctrine).

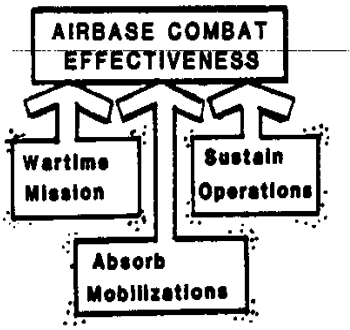


Chapter 1: INTRODUCTION

Chapter 1: INTRODUCTION

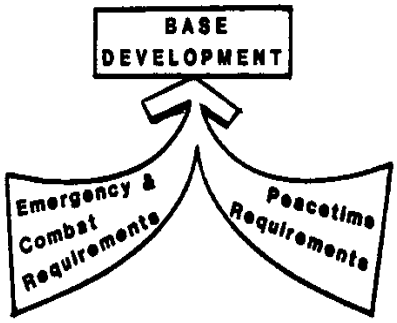
A. Purpose and Scope

1-1. Operational Capability.



a. Air Force operational capability is dependent on the effective performance of both weapons systems and basing systems. The ability to successfully project, employ and sustain airpower is directly related to the quality of the support system. The fundamental support system is the Air Force base, which must be ready to effectively end rapidly respond to emergencies.

b. Planning for combat effectiveness integrates emergency and wartime requirements with peacetime planning, and coordinates the future physical layout and development of the installation with its contingency missions. The primary purpose of planning for combat effectiveness is to ensure that Air Force bases are prepared to support the wartime mission, absorb mobilizations and deployed forces, and sustain contingency operations.



1-2. Planning Concepts.

a. The concepts and recommendations contained in this handbook must be interpreted and applied by community planners and engineers in context with the particular characteristics of their installation. Differences in mission,

threat and location combine to produce a set of factors, unique to each installation, that influence combat planning requirements and options.

b. A broad range of concepts apply to planning for combat effectiveness. This document discusses those concepts which may affect, or be affected by, comprehensive planning and require further clarification or guidance for the base civil engineering planner. For the purpose of this publication, planning activities are grouped under the following major headings:

Planning Concepts

(1) Transition to Combat: Evaluation of an installation's capability to support a surge of personnel, supplies and equipment in the event of mobilization; plans to reserve land areas and provide temporary, expanded or new facilities to accommodate evacuations, mobilizations or force beddowns.

Surge Capability

(2) The Combat Environment: Incorporation of air base operability programs, considerations and initiatives to ensure effective installation performance in a wartime situation.

Air Base Operability

(3) Physical Security and Antiterrorism: Consideration of security and antiterrorist measures in base planning and development, and analysis of land use distribution, infrastructure network and facility site selection to enhance security.

Security Measures

(4) Preparing for Emergencies: Analysis of potential disasters to ensure sustained installation operational capability during emergencies. Disaster preparedness includes an evaluation of protective shelters and recommendations to ensure a protective capability, capacity and durability.

Disaster Preparedness

(5) Vegetation and Land Form for Camouflage: Consideration of natural camouflage and construction techniques in base development and landscape planning.

Camouflage

b. References pertaining to these subjects are provided at the end of each section. A glossary of terms used in this document is included at Attachment 1. Attachment 2 is a sample base comprehensive plan contingency component. A model statement of work for contractor preparation of the component is at Attachment 3, and a bibliography of source documents is at Attachment 4.

B. Plan Integration

1-3. Operations Plans (OPlans)

Evaluate OPlans

a. Planning for combat effectiveness does not duplicate or negate currently approved operations plans, procedures or regulations, but integrates this information with base civil engineering development plans and programs. The planning process involves systematically

analyzing existing resources, identifying limitations and needs, and implementing a program to satisfy those needs. m is process does not replace current or future operations planning, but provides basic, accessible information to support OPlans.

b. The planner should evaluate the OPlans for the base to determine potential requirements -for land area, facilities and infrastructure. The current facility sitings should be reviewed to determine if they are consistent with the OPlans. m e OPlans also list limiting factors which may surface the need for changes in base development.

Limiting Factors

1-4. Base Comprehensive Plans.

a. AFR 86 -4, Base Comprehensive Planning (BCP), describes the concepts and process for base development planning. Briefly, the BCP provides a framework for base planning and development activities. Its overall policy is to manage the lands, facilities and resources under Air Force control in a manner that maximizes mission effectiveness.

Framework for Planning

b. Combat effectiveness is an essential element of base comprehensive plans. m e planning] process provides the foundation of information and direction for the BCP components. m e Land Use, Transportation and Utility Plans, in particular, are key components which must reflect combat capability in their recommendations for base development (figure 1 -1).

Plan Foundation

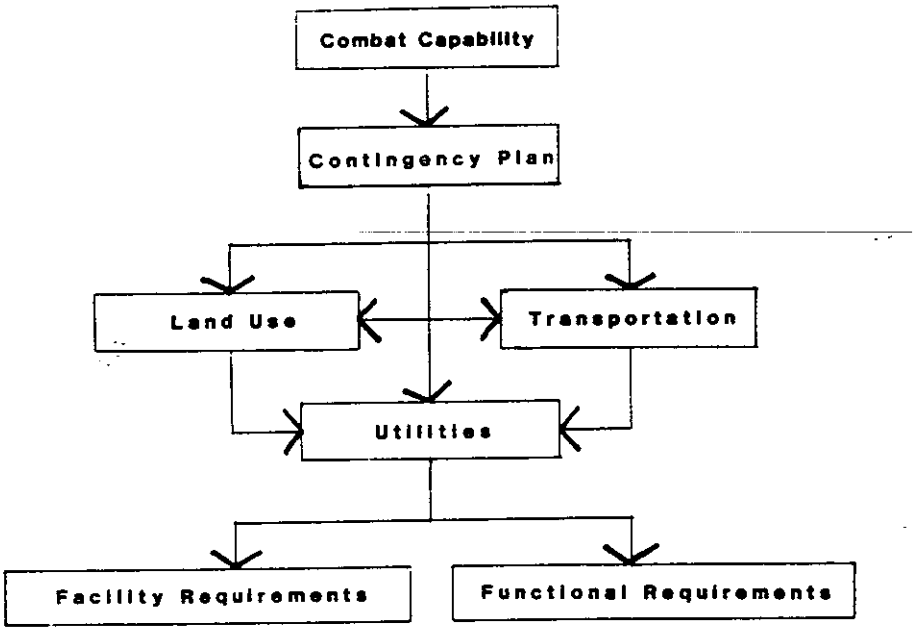


Figure 1-1. Component Relationships

1-5. The Contingency Plan Component

Required Component

a. The Contingency Plan I s a required component of the BCP. It provides the link between emergency and wartime operational requirements and base support planning activities. The component contains the major findings and recommendations resulting from the planning process, and indicates how facility and land use recommendations are incorporated into other BCP components The component should include references to the current OPlans it supports and should contain a list of all agencies and organizations participating in the planning process.

b. Tab O. The Tab O series of maps, listed in AFR 86-4, Attachment 5, provides graphic support and information for contingency planning and base OPlans. For example, Tab 0-3, Crash Grid Map, applies to base OPlan 355-1, Disaster Preparedness Plan.

Tab O Maps & Plans

c. Any assumptions or subjective decisions used as a basis for plan recommendations should be well documented. The Contingency Plan Component should be reviewed for security classification. (NOTE: If security classification is required, ensure the document is properly marked. Classified information should be kept in separable attachments. If the entire document is classified, it should be maintained as a separate document from other BCP components.)

Security Classification

C. The Planning Process

1-6. Program Management.

a. Major commands (MAJCOMs) are responsible for establishing comprehensive planning programs at their installations and ensuring that a contingency plan is a component of the overall BCP. The base facilities board (FB) is the focal point for the planning process, monitors preparation of the plan and provides direction for input to the plan by all installation organizations and tenant units.

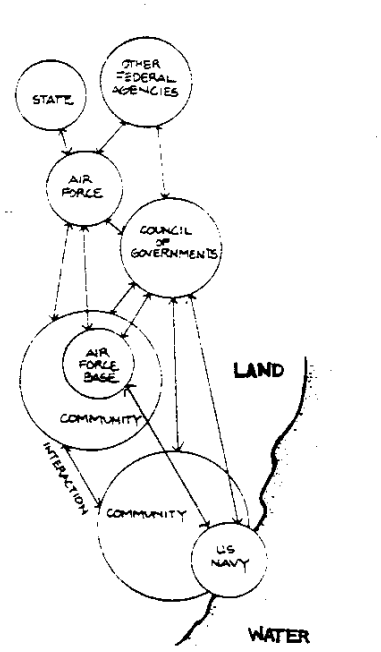
Facilities Board

b. The operational community, in particular, should nave an active role in the planning process. This effort requires a coordinated approach to ensure support and participation by all levels of command.

Operational Community

1-7. Interagency-Intergovernmental Coordination.

a. The contingency planning process should be coordinated with other military installations in the region and, when security considerations permit, with federal (or host country), state and local civil authorities and utility companies (figure 1 -2). These authorities include public safety and medical services, public works and planning agencies.



b. Within the United States, AFR 19 -9, Chapter 2, Interagency and Intergovernmental Coordination for Environmental Planning, provides guidance for installation coordination with local governments. MAJCOMs and installations may obtain coordination with federal and state agencies in the region through the Air Force Regional Civil Engineers. In most countries, installations should consult with the MAJCOM for appropriate coordination procedures.

1-8. Three-Phases of Planning.

a. Figure 1 -3 illustrates the three -phase comprehensive planning process consisting of identification, evaluation and implementation.

Phase 1. Identification: This is the information gathering phase in which operational concepts, basic deficiencies, and limitations are identified. Identification consists of defining goals and objectives for contingency operations, performing an inventory of resources and facilities, forecasting changes which are expected to occur during a contingency situation, and then analyzing the results for current and future implications.

Phase 2. Evaluation: This phase involves developing and assessing alternative courses of action to respond to contingency situations. This is followed by prioritizing recommendations that will become part of the contingency plan and incorporated into the other BCP components.

Phase 3. implementation: During this phase, plan alternatives are selected, long -term construction projects are programmed, and required improvements in services and facilities are initiated.

b. These phases overlap and may be repeated as new information is considered and alternatives are discussed. The process involves continuous monitoring and includes a feedback loop to ensure the plan is implemented.

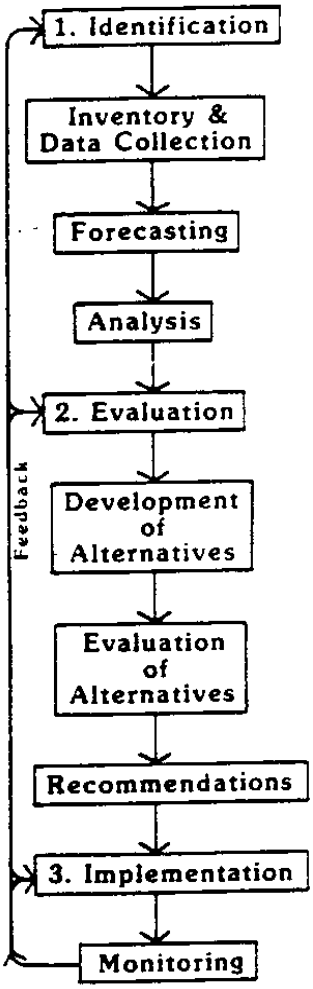


Figure 1-3. The Planning Process

Continuous Monitoring

D. General References

1-9. The following documents provide the basis and background for the planning process:

a. The Defense Guidance e (U) (Secret).

b.: Air Force 20C0: Air Power Entering the 21st Century (U) (Secret).

c. USAF Support Force Sizing Exercise (FORSIZF.).

d. USAF War and Mobilization Plan (WMP), Volumes 1-5.

e. Major Force Operation Plans (OPlans).

f. USF CONUS Base Use Plan (CBUP).

g. AFM 1-10, Combat Support Doctrine.

h. AFR 19-9, Interagency and Intergovernmental Coordination of Land Facility, and Environmental Plans, Programs, and Projects.

i. AFR 28-3, USAF Operation Planning Process.

j. AFR 28-5, USAF Mobilization Planning.

k. AFR 28-31, Base Support Planning.

l. AFR 86-1, Programming Civil Engineering Resources.

m. AFR 86-3, Vol. 1, Planning and Design of Theater of Operations Air Bases.

n. AFR 86-4, Base Comprehensive Planning.

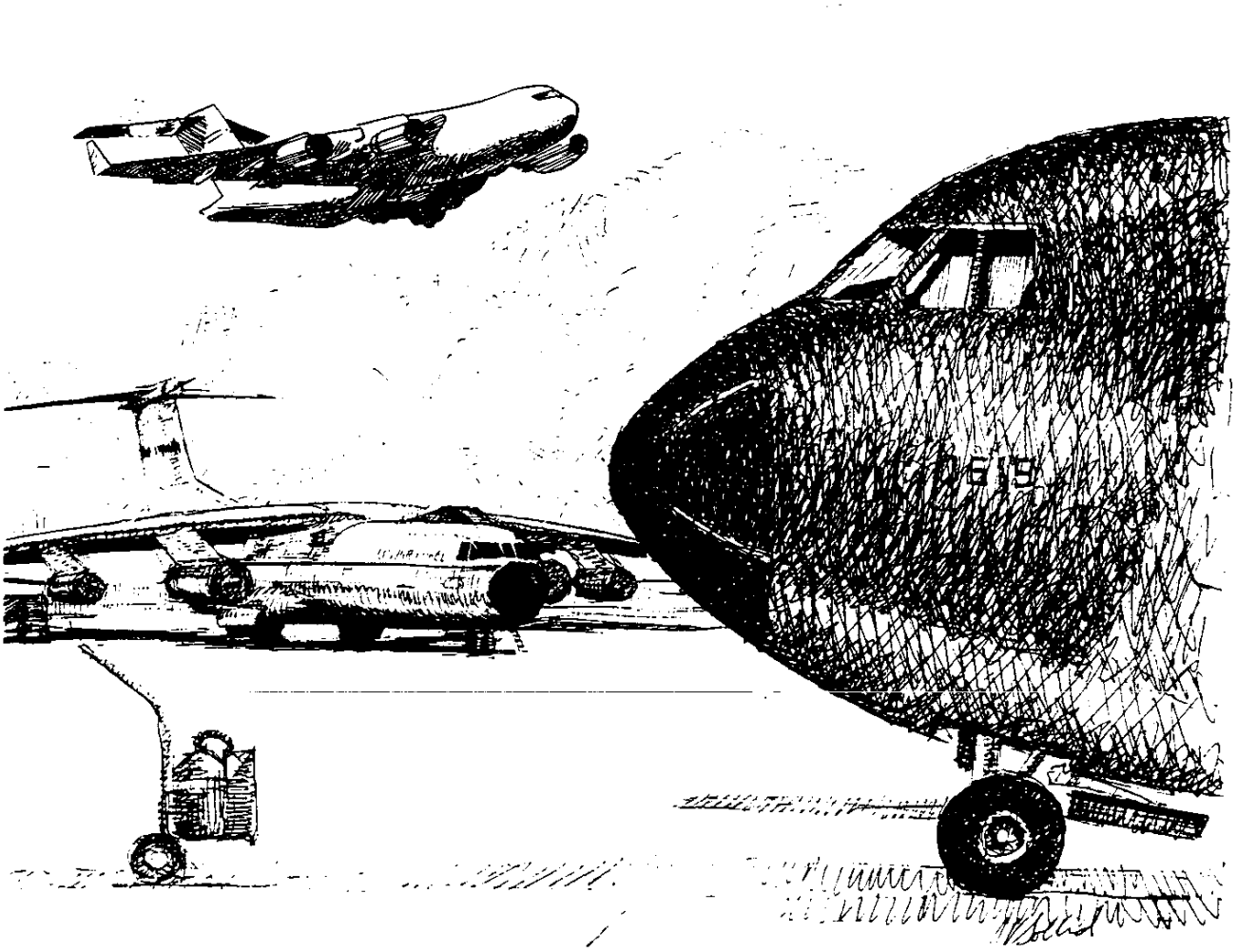
o. AFRM 93-2, Contingency Response Planning.

p. AFR 360-1, Air Base Operability.

q. AFP 360-2, Wing Commander’s Air Base Operability (ABO) Planning Considerations Guide.

r. Base Capability Acquisition Plan (B-CAP).

s. Unit ABO Plan.



Chapter 2: TRANSITION TO COMBAT

Chapter 2: TRANSITION TO COMBAT

A. Surge Capability

2-1. Definition and Purpose.

a. Surge capability is the potential for an installation to rapidly and effectively absorb and support increased mission roles of additional aircraft, personnel, supplies and equipment in the event of a mobilization, deployment or evacuation. The transition from a peacetime to a contingency base operation will involve significant changes that must be anticipated in development planning. The planning process requires a comprehensive analysis and evaluation of installation expansion capabilities. Tenant and deploying units also must be included in the planning process.

Expansion Capabilities

b. Surge requirements are derived from Conus Base Use Plans, theater reception plans, and MAJCOM, unified and specified command operations plans. These requirements also provide input top Base Support Plans prepared under AFR 28-31 requirements. Consolidating this information to determine expansion requirements results in greater accuracy and thoroughness, eliminates duplication of effort, and permits better coordination among affected units and functions.

Base Support Plans

c. In general, installation surge capability will include:

(1) Evaluating the base's holding capacity and determining available base resources. Surge capability planning should include the programming and execution actions, both short - and long-term, to develop necessary facilities (pavements, revetments, etc.), systems and equipment to support the expansion.

Holding Capacity

(2) Evaluating the installation infrastructure in terms of current usage, capacity and physical condition. The term infrastructure includes all utilities, roads and communications-computer systems on the base.

Infrastructure

(3) Developing graphic information supporting the analysis, recommendations and conclusions in the plan text (Tab 0 -1 of the Base Comprehensive Plan).

2-2. Planning Methodology.

a. The entire base should be viewed as a system; do not focus on one function or area, but visualize a coordinated, cooperative effort to support the expansion. As part of the evaluation, two levels of contingency requirements must he identified:

Cooperative Effort

(1) Expedient Beddown: the initial provision of austere facilities to meet short term requirements ranging from one to six months.

(2) Follow -on: upgraded or new facilities to meet long -term requirements.

Flexibility

b. Flexibility is essential to support evolving or changing expansion requirements. The existing base layout, road network, utility distribution and relationship among various base functions all combine to influence the transition capability of the base. Additionally, the siting, orientation and design of proposed new facilities should be aimed at increasing effective response capability.

Response Options

c. If possible, there should be more than one response option for each envisioned expansion scenario. For example, in considering billeting requirements, review available space in existing dorms, family housing units, administrative areas, etc., as well as vacant land areas for setting up a tent city.

Long-range Planning

d. The surge capability analysis is a fundamental part of long -range planning for future base development and supporting infrastructure. The analysis performed as part of the surge capability assessment will provide the basis for other components of the comprehensive plan.

e. Support that can be obtained from the local civilian community (motels, storage, construction materials and equipment, etc.) should be considered in assessing surge capability. Short -term requirements can be satisfied if similar services are available off -base for an emergency. Use of off -base resources must be weighed against security a w safety implications, and the possibility that they will w t be readily available in an emergency. Potential emergency support facilities should be identified on the base vicinity maps (figure 2 -1).

Short-term Requirements

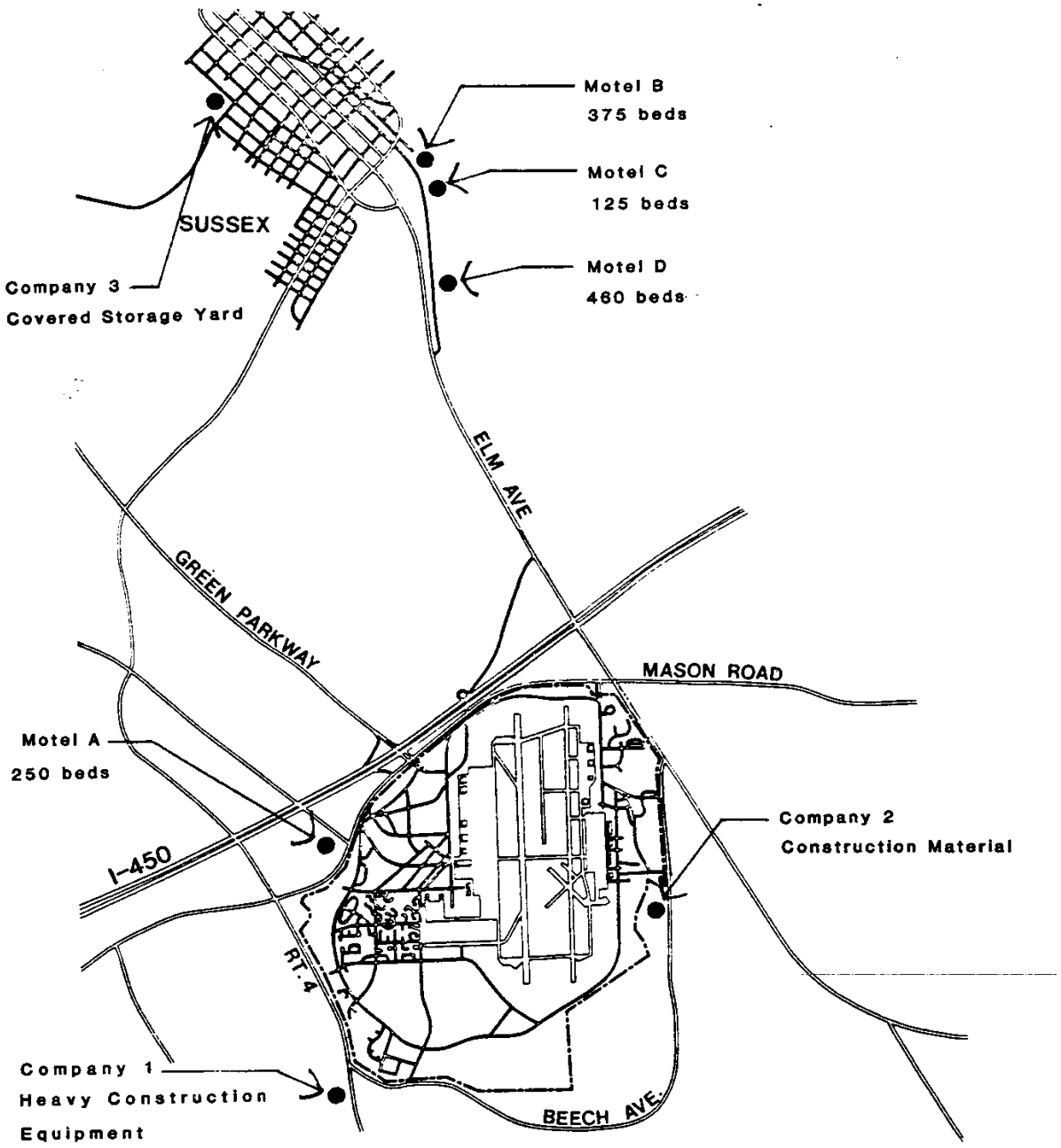


Figure 2-1. Off-Base Facilities

B. Surge Capability Assessment

2-3. General Requirements:

a. The assessment of surge capability involves an overall inventory of base facilities, infrastructure, pavements and available land. Undeveloped open space, which is unencumbered by significant development constraints, including airfield clearances, explosive quantity -distance clear zones or other factors (such as steep slopes, flood plains, etc.), and are not in primary target area, are ideally suited for accommodating expanded requirements.

Expansion Requirements

b. In the absence of sufficient undeveloped open space, recreational open space, such as large playing fields, should be considered for temporary uses, such as a bivouac site (.tent city"), mobile hospital, and supply storage/staging areas (figure 2 -2).

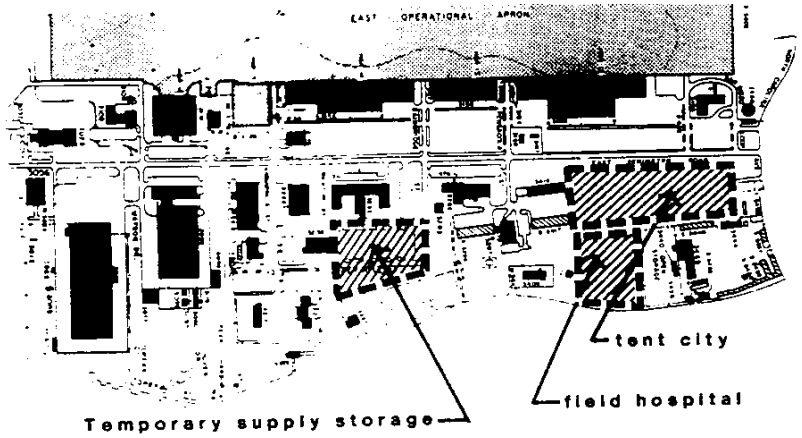


Figure 2-2. Contingency Open Space

c. Where it is necessary to improve or expand a facility, function or system to increase capability, short -term emergency improvements and long -term programming actions should be determined.

Planning Needs

2-4. Priorities: In determining land and facility requirements, specific planning needs must be identified, in a priority sequence of what must be done and in what order, to transition from a peacetime, non-emergency operational environment to contingency operations. Existing physical capabilities and possibilities should be identified, rather than assumptions as to what would be desirable. Although many different requirements must be considered at each installation, a representative list is provided below:

a. Operational Requirements.

b. Utility Systems and Services.

c. Transportation Network.

d. Essential Support Facilities.

e. Other Support Facilities.

2-5. Operational Requirements:

Aircraft Parking

a. Is there sufficient area to expand the aircraft parking apron? Can aircraft park on unused taxiways, hardstands, runways, etc.?

A pavement bearing capacity survey should be performed on all current and potential aircraft parking surfaces. Dispersed aircraft parking locations should be revetted whenever possible.

POL Storage

b. What is the capacity and expansion capability for jet fuel or other POL storage? What is capacity of fuel lines, pumps and hydrants? For munitions storage and handling? Indicate required expanded storage areas or temporary marshaling areas on the Tab 0-1.

Ops & Maintenance

c. What is the capacity and expansion capability for aircraft operations and maintenance facilities? Do facilities exist which provide splinter protection as a minimum?

Equipment

d. Are there areas for the storage of aircraft ground equipment (AGE) and munitions handling equipment (MHE) associated with deploying units?

NAVAIDS

e. What are the capabilities and limitations of navigational aids/air traffic control services?

f. Figure 2 -3 illustrates some of the operational considerations to be noted on base plans.

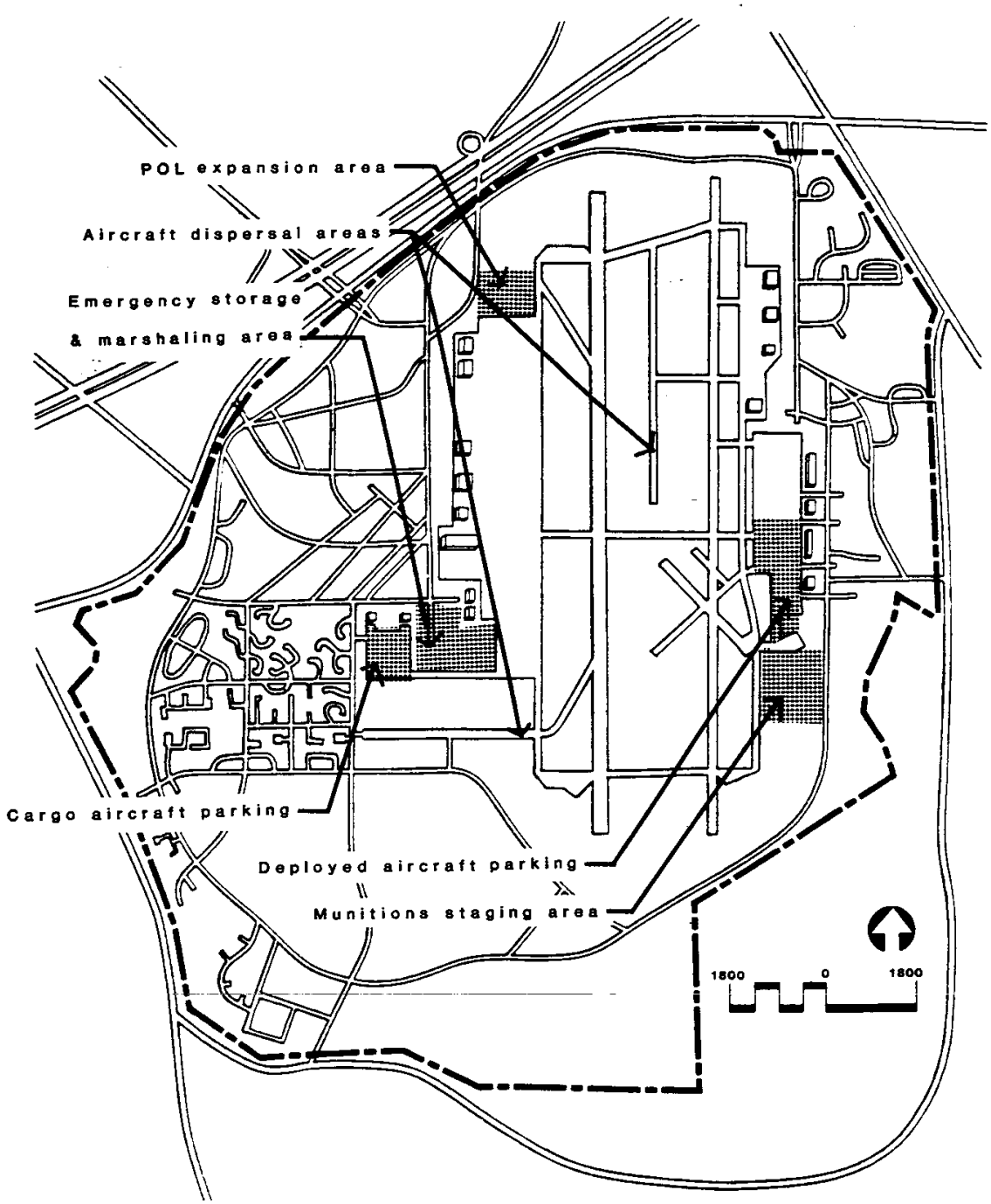


Figure 2-3. Operational Requirements

2-6. Utility Systems and Services: Determine the maximum effective population that can be supported by the most restrictive element of the existing utility systems (figure 2 -4). What temporary improvements can be made to increase capability? With temporary improvements assumed to be in place, what population could be served? Temporary improvements should also address non potable water sources for use in firefighting.

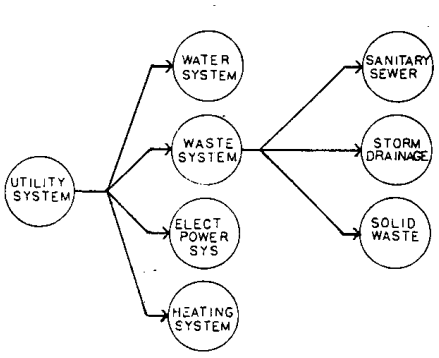


Figure 2 4. Utility Systems

a. Identify other emergency water sources (water trucks, trailers, bladders, etc.) which are available.

b. Are stand -by generators available for critical services and new surge requirements (for example, computers, communications, hospital, command post, navigational aids)?

d. What is the expansion capability for vehicle parking, maintenance, and storage areas?

2-7. Transportation Network: The existing road system should be analyzed for its capacity and potential to handle increased traffic due to the surge population and activities.

Road System

a. What improvements or changes in traffic routing can be made to accommodate the surge? Identify new traffic and parking generating activities and locations.

b. Is there a quick response time to the flight line? Are there alert access routes? These should be reviewed for adequacy and indicated on the Tab 0 -1.

c. What additional vehicle parking requirements are necessary?

d. Does the vehicle maintenance area need to expand to provide additional storage and maintenance facilities?

e. What is the potential to use mass transit vehicles to replace use of POVs on base?

2-8. Essential Support Facilities: Determine the number of individuals, by rank (airmen, NCOs, officers), and the number of military family members expected in an expansion situation. Capacity and expansion potential should be identified for the following facilities:

a. Dormitories. How many additional personnel can be billeted in existing dorms? Is additions space available for temporary sleeping quarters within administrative facilities? Is vacant, usable land available for a tent city? Sites reserved for the tent city should be shown on the Tab 0 -1.

b. Medical/dental facilities.

c. Dining facilities.

d. Personnel and finance records.

e. Mortuary services.

f. Other requirements.

2-9. Other Support Facilities: What is the capacity and expansion potential for the following facilities or non -combat locations):

a. Family housing. Can more than one family occupy a housing unit on a temporary basis?

b. Dependent school, child development center, youth center,

c. Indoor and outdoor recreation activities.

d. Base exchange and commissary.

e. Chapel services.

f. Other requirements.

C. References

2-10. Refer to the following documents for surge capability planning and guidance policy:

a. AFR 28-5, USAF Mobilization Planning

b. AFR 28-31, Base Support Planning.

c. AFR 127-100, Explosives Safety Standards (see especially Chapter 8)

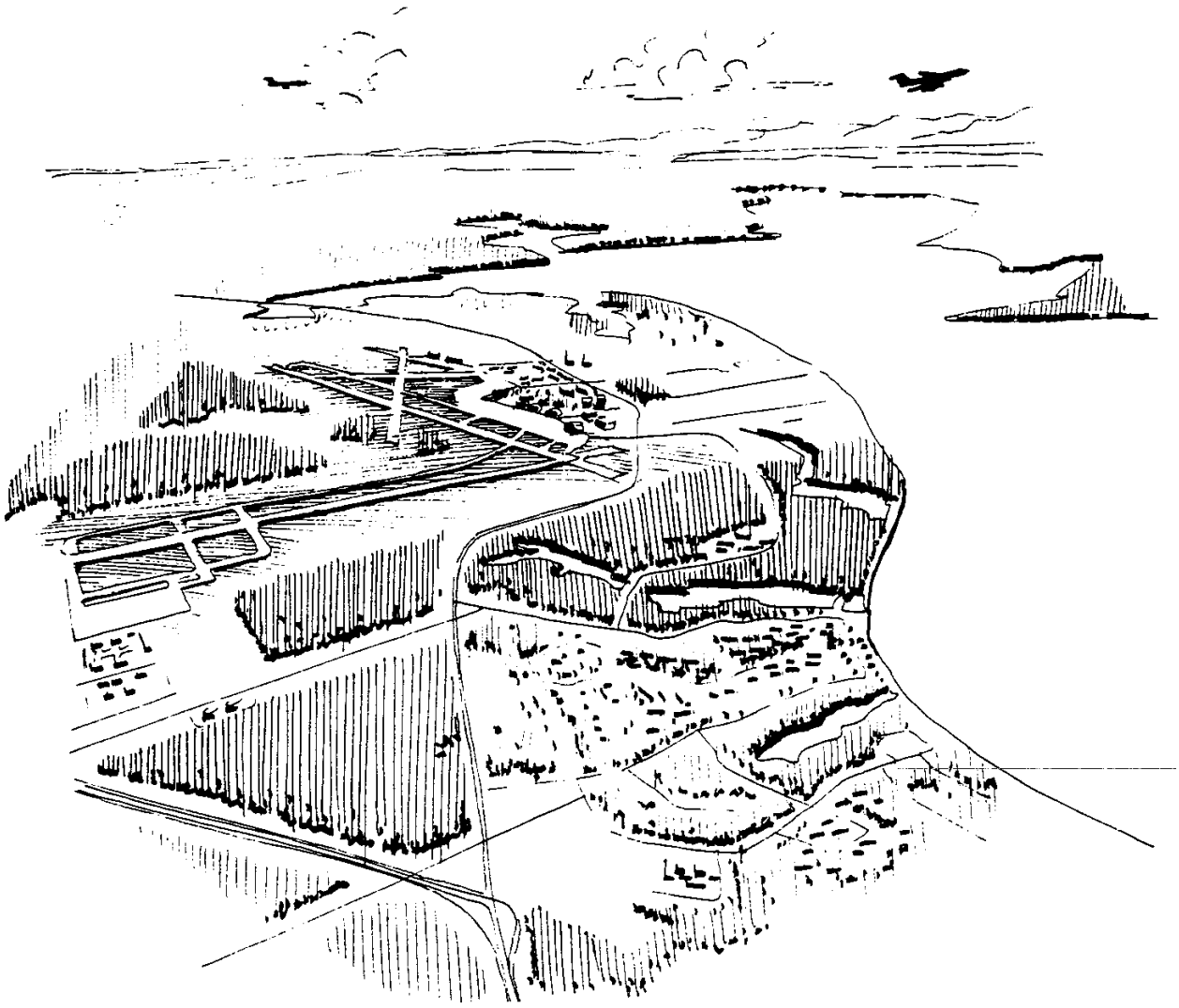
d. MAJCOM War and Mobilization Plans.

e. Planning Factors for Military Construction in Contingency Operations (MJCS 235-86)

f. CONUS Base Use Plans

g. Theater Reception Plans

h. Base Operations Plans



Chapter 3: THE COMBAT ENVIRONMENT

Chapter 3: THE COMBAT ENVIRONMENT

A. Air Base Operability

3-1. Purpose. Air Base Operability (ABO) is an Air Force program which provides commanders with the capability to destroy attacking air and ground forces, to limit damage, and to survive, recover, and continue to operate under attack or post-attack conditions (AFR 360-1). The program provides the basis for incorporating a warfighting perspective in peacetime installation planning and development.

Attack & Post-attack Conditions

3-2. Scope.

a. ABO provides the capability for the base to sustain flight operations in a combat environment. The program is designed to integrate base level assets (manpower, equipment, vehicles, infrastructure and other systems) to enable the employment of air power and provide for sustained combat capability.

Base Assets

b. Combat capability is not only linked to aircraft sortie generation, but includes the entire combat support spectrum of defense, missile, radar, communications, storage, supply and other facilities, as well as ensuring aircraft launch and recovery capability. In addition to base resources, ABO also includes host nation support

agreements, the NATO infrastructure program, and other service and allied initiatives designed to ensure operability.

B. Planning Considerations and Initiatives

3-3. Planning Considerations.

a. The fundamental elements of the ABO program are air base defense, survival, recovery, support and generation. The following is a brief description of each element:

(1) Defense - active defense measures, including attack warning and assessment facilities and equipment; surface to air missiles and guns; defensive fighting positions; tactical sensors; deployable security forces and rear area support (to include other service and host nation forces).

(2) Survivability (Passive Defense Measures) - hardening protection/shelters for personnel, munitions, communications, aircraft, work centers and utilities; camouflage, concealment and deception; chemical/biological and conventional detection and warning systems; aircraft dispersal sites; alternate launch and recovery surfaces; and access taxiway improvements.

(3) Recovery - fire, crash and rescue equipment; medical support facilities; emergency generators; water supply and servicing; vehicle repair and supplies; damage assessment; minimum operating strip selection; rapid runway repair, contingency airfield lighting and mobile arresting systems; expedient facility repair; unexploded ordnance safing and removal; and utility repair.

(4) Support - internal and external air traffic control/navigational aids, communications systems, microwave, satellite, host nation telephone lines; automated data processing, base cable plant and communications centers; critical vehicles and supplies; prepositioned stockpiles; resupply; additive forces and equipment.

(5) Generation - crash recovery and battle damage repair; aircraft shelters and dispersal parking; alternate launch and recovery surfaces; access taxiways; minimum operating strips; emergency off -base aircraft landing and launch sites; navigational aids and weather equipment; contingency airfield lighting and mobile aircraft arresting systems.

b. The layout of an installation can contribute to, or detract from, the successful employment of these elements. Limited real estate, and competing demands, such as facility dispersal for survivability versus the increased functional effectiveness achieved by facility proximity, will influence

planning decisions. Overall combat capability should be the primary consideration. Toward this end, the following concepts should be applied toward base comprehensive planning:

(1) High Threat Zones (HTZs).

High Value Targets

(a) These zones are areas on the installation with high value targets with a high potential for enemy air and ground attack. The HTZs are determined by the major command and base intelligence offices, the base Directorate of Operations, in coordination with the Office of Special Investigations and security police.

b. Examples of HTZs include airfield pavements, aircraft parking, operations and maintenance areas, weapons and fuel storage sites, and command, control and communications facilities. Other potential targets include power generation and water supply facilities, and base defense positions.

Facility Dispersal

(c) The primary consideration is the relative location of combat related facilities in the HTZ. A linear alignment of buildings is an ideal reference point for an air attacker, and presents a desirable target affecting a greater number of functions. New facilities should be located and oriented to avoid the straight alignment and grouping of structures (figure 3 -1).

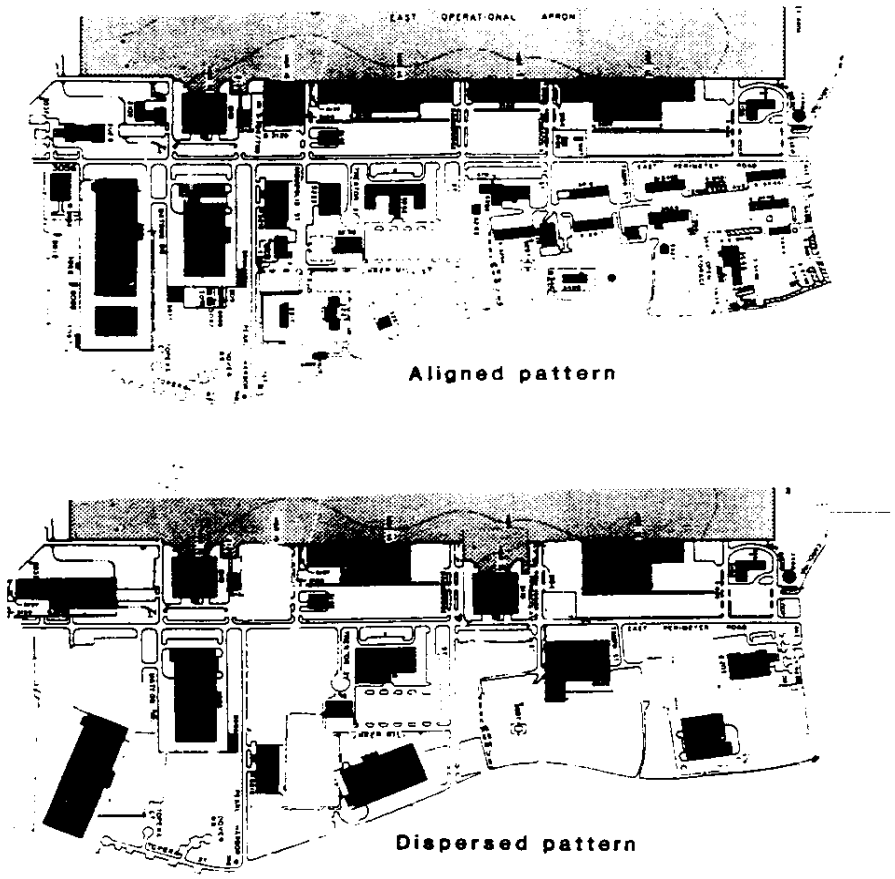


Figure 3-1. Facility Dispersal

Base Support Facilities

(d) Another consideration is the location of base support facilities within the high threat zones. Facilities that are not directly combat related, such as community services and commercial functions, administrative buildings and housing areas, should be located away from the HTZ.

(e) Functions that are not combat related, or do not require functional adjacency to combat related uses, should be evaluated for possible relocation if they are within the HTZ.

(f) Functions that tend to cluster high value targets in one area, should be moved to facilities outside of the zone, or away from other potential targets.

(2) Explosive Safety.

Q-D Zones

(a) During combat operations, the explosives quantity -distance (Q -D) safety clearances associated with weapons storage areas (WSA), weapons on uploaded aircraft, hot cargo pads, and temporary munitions storage and marshaling areas, are more important to the safety and operational capability of the base than at any other time. Not only is there a heightened danger of accidental detonation due to the increased munitions handling activity, there is the added danger of detonation from attacks on the base.

(b) To ensure that explosive safety considerations are included in contingency plans, the Q -D zones (figure 3 -2) should be based on the wartime tasking and configuration of the WSA and other explosives storage and handling locations. These Q -Ds should be validated and indicated on the Tab D -8.

(3) Fuel Storage Sites.

(a) Among the highest value targets on the base are fuel storage sites and distribution systems. Similar to the WSA in their peacetime and wartime vulnerabilities,

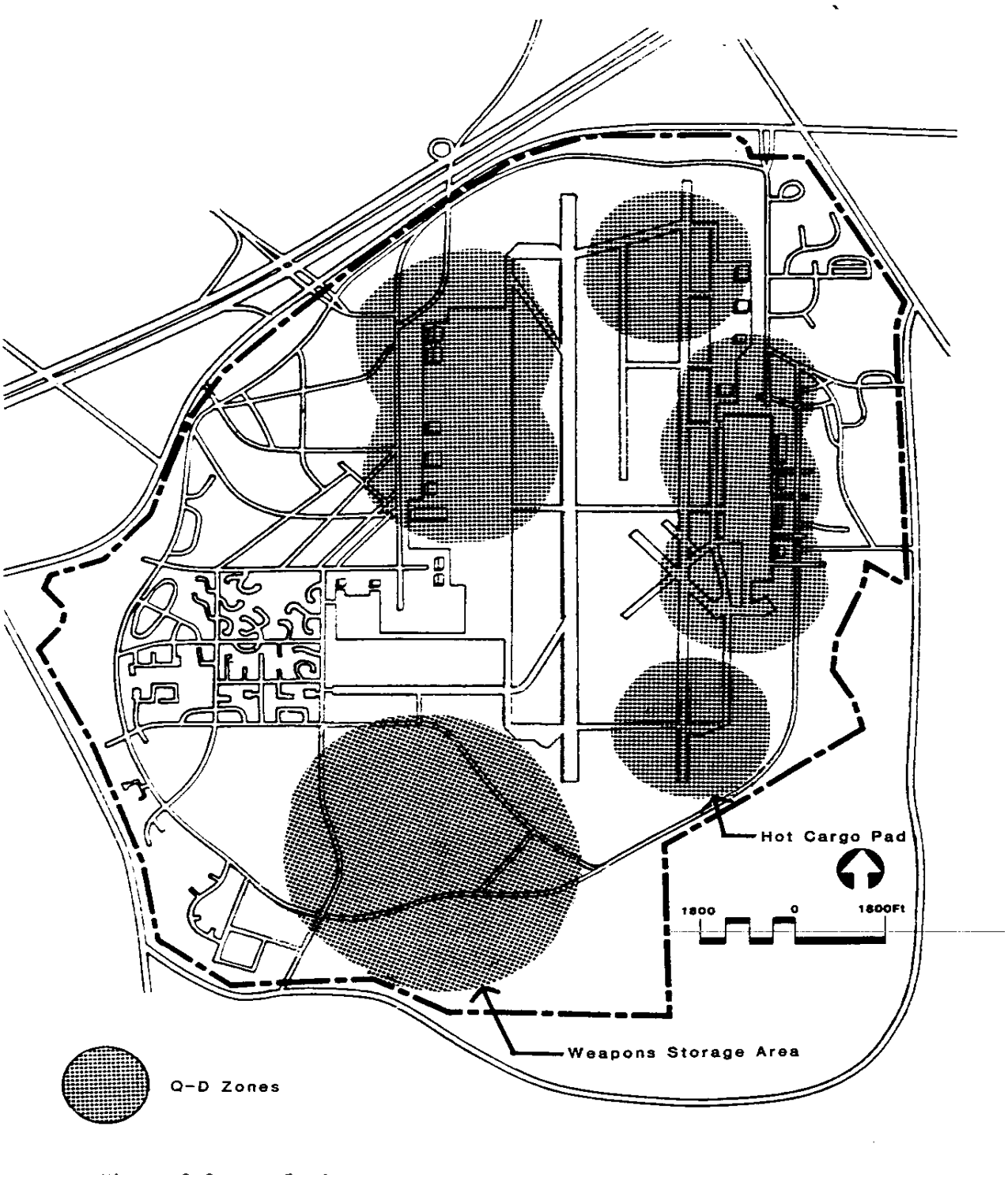


Figure 3-2. Explosive Q-D Zones

they are critical to the mission, and present a major safety hazard to the base.

(b) Fuel storage sites and associated handling facilities should be separated from all other potential targets. To limit adverse impacts due to a fuel spill resulting from a breached containment berm, fuel storage tanks and bladders should be located down -slope from other base areas. Because fuel storage tanks have unique visual profiles, they should be concealed (see Chapter 6) and dispersed if possible. The entire fuel distribution system, including pipes, valves, controls, pumps and generators, should be hardened to the same level. As a minimum, above -ground valves and pipes should be provided splinter protection.

(4) Environmenta1 Resources.

Combat Preparations

(a) Base operational capability during wartime is related to the capabilities established during peacetime. The base is reliant to a great extent on the environment in which it is located. Damage to the environment by both on -base and off-base sources can hamper effective combat preparations. Ignoring environmental concerns may result in lack of community support and decreasing tolerance to military activities. This may serve to limit our ability during peacetime to construct facilities, conduct training activities, and beddown systems, resulting in degradation to our warfighting

capability. Attention should be given to activities which have the potential to cause environmental problems. These include:

- Handling of hazardous materials and disposal of hazardous waste.

- Construction activities in undisturbed forested areas, wetlands, or unique habitats.

- Sewage treatment, including the capacity and condition of facilities, and the adequacy of treatment and disposal.

- Aircraft operations over noise sensitive areas.

- Release of gases, fumes, etc.

- Solid waste management.

(b) Environmental considerations during wartime will include the expedient disposal of toxic wastes and debris. Specific c areas on the base should be designated as emergency wartime disposal sites to avoid possible contamination and mission degradation.

Wartime Disposal Sites

3-4. Planning Initiatives.

a. Various A W initiatives are being implemented to enhance installation combat capability (figure 3 -3):

(l) Alternate Launch and Recovery Surfaces (ALRS).

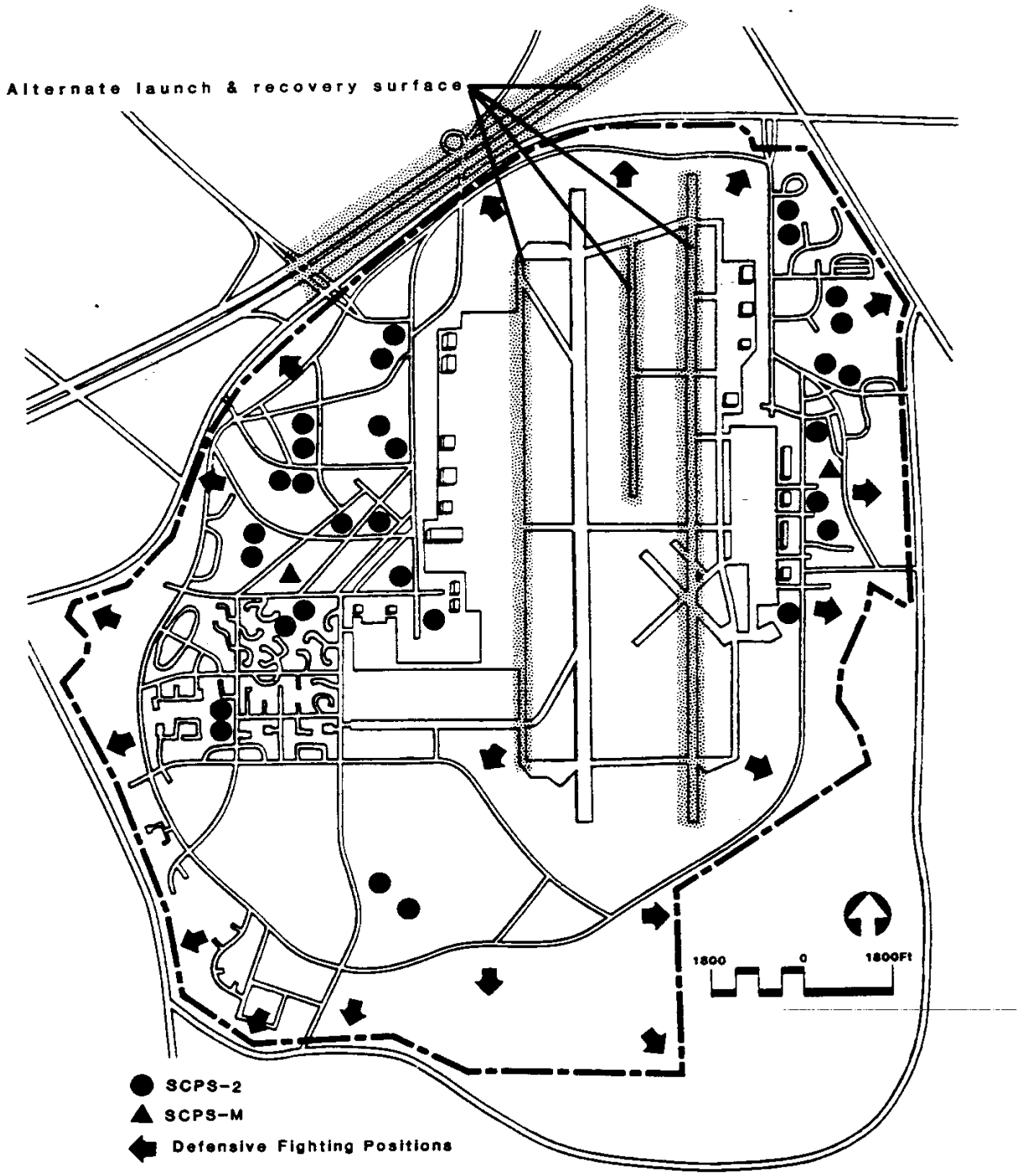


Figure 3-3. ABO Initiatives

Figure 3 -3. ABO Initiatives

(2) Survivable Collective Protection System -2 (SCPS -2) and -Medical (SCPS -M9.

(3) Defensive Fighting Positions (DFPs).

(4) Hardened Communications and Utilities.

(5) Attack Control Facilities.

b. These initiatives should be considered in developing the BCP. This section identifies land use and site planning criteria for each initiative, recognizing that the unique situation at each base may result in other solutions. The civil engineering planner will need to work with the local ABO division, the air base ground defense commander, the tactical deception officer, and other offices such as explosive ordnance disposal and safety, to ensure their interests are considered for implementation during the planning process.

Land Use & Site Planning

c. **Alternate Launch and Recovery Surfaces (ALRS):** provide redundant aircraft operational surfaces for use in the event the main runway(s) cannot be used. The following are planning considerations:

(1) Orientation: determine prevailing wind direction and climactic conditions. Consider orienting so that AURS is not parallel to, or aligned with primary runway.

(2) Topography: minimize the cut and fill of recontouring the land for the ALRS and related taxiways.

(3) Airfield and airspace clearances: identify obstructions on the airfield and the surrounding area that could affect flight safety. Remember, aircraft returning from combat missions may be damaged and their maneuverability limited.

(4) Navigational aids and airfield support facilities: assess the possibility of replacement or relocating this equipment to accommodate multiple runway use.

(5) Proximity: avoid siting the ALRS near the main runway, since this high threat zone is subject to the first attack. AIRS should be a minimum of 500' (centerline to centerline) from the main runway or other alternate surface.

(6) Also consider existing taxiways and off-base roads as potential ALRS. If an off-base road is determined to be a feasible ALRS, determine route from the base to the ALRS to accommodate towed or taxied aircraft, and maintenance, fuel and munitions vehicles.

Nuclear / Chemical Threat

d. **Survivable Collective Protection System-2 (SCPS-2) and -Medical (SCPS-M):** these units provide safe shelter for persons in a nuclear/chemical attack. Overall dimensions for the SCPS -2 are 56' by 98'; the SCPS -M is 49' by 132' (figure 3 -4).

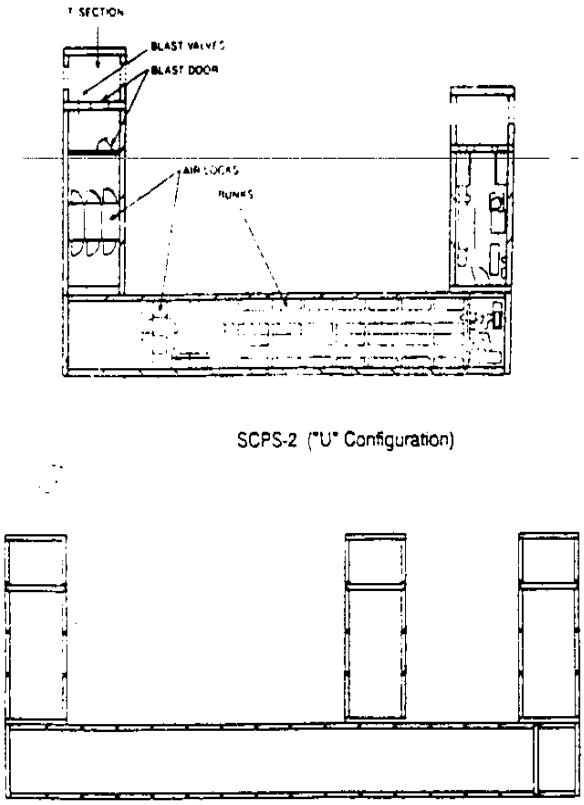


Figure 3-4. SCPS Plan View

They are partially buried and earth -covered for protection and camouflage. The SCPS -M was adapted from the SCPS -2 design to facilitate wartime medical activities. Table 3 -1 lists major siting criteria from the SCPS Siting Guide (reference 3 -Sf). In addition to siting criteria, also consider the following:

(1) Provide adequate separation between SCPS to allow access for construction equipment.

(2) Provide roads to SCPS for generator refueling, water resupply, and sewage removal.

Start near areas of high population density and look for sites that meet these guidelines

- Within walking distance for assigned personnel
- Survivable

  - Entrance oriented away from probable targets
  - At least 50 ft from adjacent SCPS
  - Do not site more than 3 SCPS units, semihardened or protected facilities, or aircraft fuel installations in a direct line over a 1500-ft distance.

- In compliance with airfield criteria (AFR 86-14)

  - At least 700 ft from runway centerline
  - No higher than 7-to-1 transitional slope beyond this distance
  - At least 200 ft from centerline of taxiway used for transport aircraft
  - At least 65 ft from centerline of taxiway used by tactical aircraft
  - At least 30 ft from hardstands for tactical aircraft

- In compliance with explosive siting requirements (AFR 127-100)

  - At least 150 ft between any aircraft shelter and a SPCS unit with a 3-ft berm
  - At least 50 ft between any aircraft shelter and a SCPS unit with a 5-ft berm
  - Minimum separation distance from other explosive sources as follows:
    - K-9 for SCPS with 3-ft berm
    - K-3 for SCPS with 5-ft berm

- At least 100 ft by 150 ft
- Without the following, if possible:

  - Trees
  - Buried utilities
  - Surface or subsurface rocks

Table 3-1. SCPS Siting Criteria

(3) Avoid siting in areas having high groundwater. Since the SCPS is partially buried, high groundwater poses A major siting problem.

e. **Defensive Fighting Positions (DFPs):** these small camouflaged bunkers, partially buried, are for use by forces to defend the base from ground attack. Siting considerations are as follow:

Security Forces

(1) Site in areas with clear fields of view which dominate approaches to critical resources. Coordinate fields of fire with other DFPs.

(2) Take advantage of existing topographic features and natural vegetation in considering camouflage and concealment of DEPs.

(3) Avoid areas with high groundwater and where soil drainage is poor.

(4) Consider the nighttime shadows and glare sources that might hinder visibility.

(5) Avoid siting new facilities which obstruct lines of sight for existing DEPS.

f. Hardened Communications and Utility Lines:: The effectiveness of the base during combat depends to the greatest extent on the communications network and utility systems. Planning considerations include the following:

(1) Avoid running lines to critical functions through locations which are potential targets.

(2) Site critical junctions (valves, substations, pumps, switches) away from high value targets.

(3) Site junction boxes and other connections for easy access and maintenance in combat situations.

Command & Control

g. Attack Response Facilities: The wing commander has the responsibility to direct combat response forces at the base. Key command and control facilities must be sited away from areas subject to air and ground attack. Major facilities in this category are:

(1) Wing Operations Center ~WOC): Responsible for the overall direction of base combat operations.

(2) Survival Recovery Center (SRC): Supports passive defense operations and recovery forces. The SRC will normally be located with the WOC.

(3) Nuclear, Biological, and Chemical (NBC) Cells: Provides warning on expected arrival of NBC hazards, predicts the effects of NBC attacks, and advises the wing commander through the SRC of NBC hazards on the base. The NBC Cell is located with the Disaster Preparedness Control Center or the SRC.

(4) Air Defense Control Post (ADCP): Focal point for air base point air defense activities and provides air defense warning information the WOC and the Base Defense Operations Center. The ADCP will normally be located with the WOC.

(5) Base Defense Operations Center (BDOC): Operated by the ground defense commander who directs, coordinates and controls ground defense forces.

h. Other Considerations: The following facilities should be dispersed and sited away from high value targets. They require good access to roads leading to the flightline and should be sited outside explosive quantity -distance safety zones if possible:

(1) Mobile Aircraft Arresting System (MAAS) storage.

(2) War Reserve Materials.

(3) Jet engine storage facilities.

(4) Rapid runway repair materials.

C. References

3-5. **Refer to the following documents** for further planning information and guidance:

a. AFR 28-31, Base Support Planning.

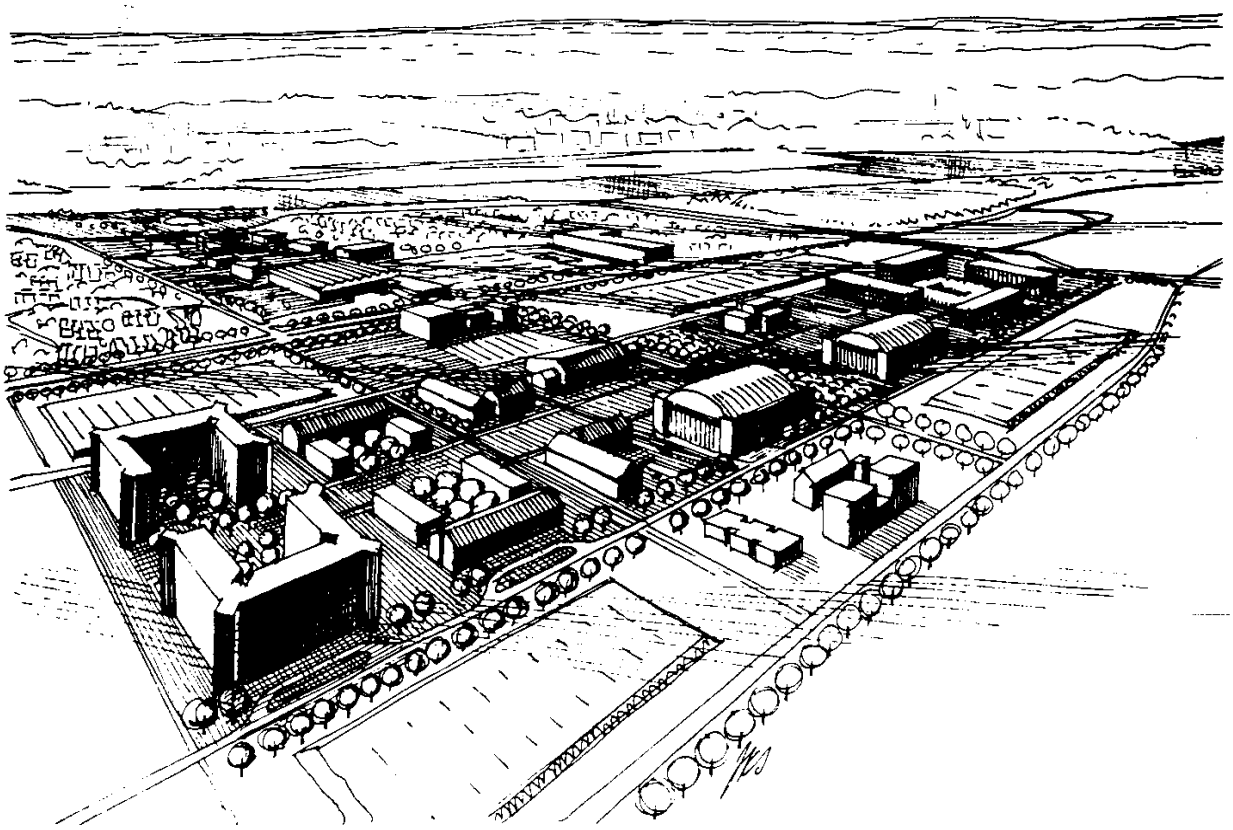
b. AFR 127-100, Explosives Safety Standards.

c. AFR 206-2, Air Base Ground Defense.

d. AFR 360-1, Air Base Operability, and AFP 360-2, Wing Commander’s ABO Planning and Consideration Guide.

e. AFR 700-XX, Tactical Command, Control, Communications, and Intelligence Interoperability and Compatibility (Draft).

f. SCPS Siting Guide, July 1987, AD/TQO, Eglin AFB, Florida.



Chapter 4: PHYSICAL SECURITY AND ANTITERRORISM

Chapter 4: PHYSICAL SECURITY AND ANTITERRORISM

A. Defining the Problem

4-1. Purpose and Scope.

Planning & Facility Siting

a. This chapter presents planning and facility siting measures to enhance physical security and protect Air Force installations against terrorist actions. The most effective and least costly protective measures are those incorporated during plan development, project site selection and facility design.

Reduce Vulnerability

b. A1though it is not possible to protect an installation against all possible emergencies all improvements can be made through the arrangement of land uses, the routing of transportation and utility systems, and the location, orientation and design of facilities, to reduce their vulnerability to the regional threat.

C. Where physical protection is a concern at existing facilities, cost effective measures need to be developed in concert with the facility users. A1though retrofitted protective measures are often less effective than those incorporated during project design, the use of screening, barrier placement, changes in vehicle access and

parking, and rearrangement of interior functions s can enhance physical protection.

B. Base Security Plans

4-2. Planning Methodology.

a. The base security plan, identified by the short title OPlan 207, includes detailed guidance for security response options and describes the security support to be given priority resources (primarily weapons systems). The plan is prepared and updated by the base security police, who are also responsible for the resources protection plan required by AFR 125 -37. The resources protection plan covers all resources not included in OPlan 207.

b. Physical security considerations also are included as annexes to other base OPlans, usually written at the major command. These annexes state the security support needed for the contingency operations described in the OPlan. m e annexes direct the security measures that will be initiated or changed when the OPlan is implemented. The purpose is to ensure that security requirements are properly related to other elements of the plan.

Security Support

c. The Contingency Component is developed in coordination with the Security Council at each base. The component should

contain recommendations for base layout, facility sitings and construction projects required to enhance physical security. Additionally, changes in transportation and utility systems, functional relocations, aircraft parking, fencing and lighting should be included in the Tab 0 -2 series of maps.

4-3. Security and Land Use.

Physical & Functional Impact

a. Physical security considerations can have a major impact on the installation, both physically grow it is built) and functionally (how it operates). The overall layout and appearance of the installation is affected by the physical impact, while installation productivity and operational capability is affected by the functional impact.

b. Most of the site security measures now in place at Air Force installations have evolved in response to changing programmatic requirements. Few measures were implemented as part of a comprehensive analysis of the entire installation.

Security System

c. Figure 4-1 shows a base on which the current security system has evolved over the past 40 years. The impact of this evolution on traffic circulation and operational effectiveness is illustrated by the following points:

(1) The travel time between facilities is significant because of the large number of separate buildings and

functions. This separation of related uses limits efficient pedestrian movement. Additionally, the funneling of great volumes of traffic through selected gates causes significant congestion during peak periods.

Duplication

(2) There is a duplication of roads and walkways to serve areas both inside and outside the security areas. Significant amounts of fencing and perimeter lighting are required to accommodate the extended perimeter.

d. The situation shown in figure 4 -1 is partially the result of providing protection to a site that has basic deficiencies in

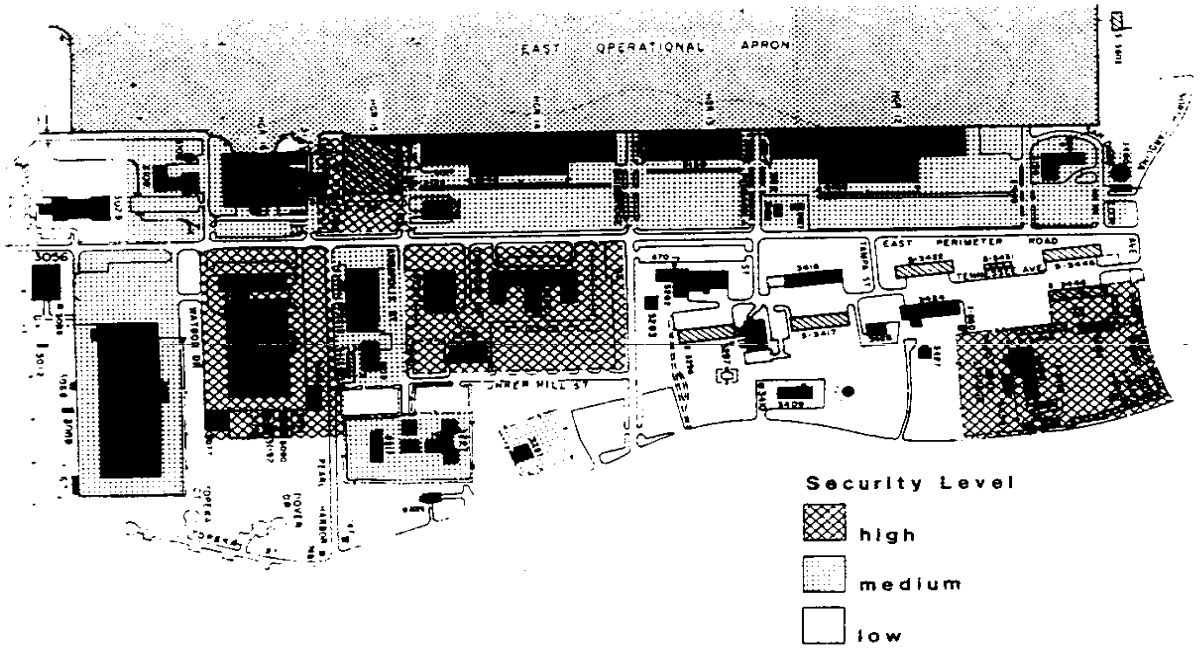


Figure 4-1. Existing Security Zones

functional relationships, and not the result of the implementation of security measures. The security system has amplified these deficiencies to the point that the efficiency of the site has been adversely affected.

Deficient Areas

e. The existing land use map of the base, figure 4 -2, indicates some of the functionally deficient areas. Note that many administrative support functions intrude on the industrial and aircraft operations and maintenance areas. A traffic survey of the site would help identify these deficiencies by illustrating the many extra vehicle trips required for functional interaction.

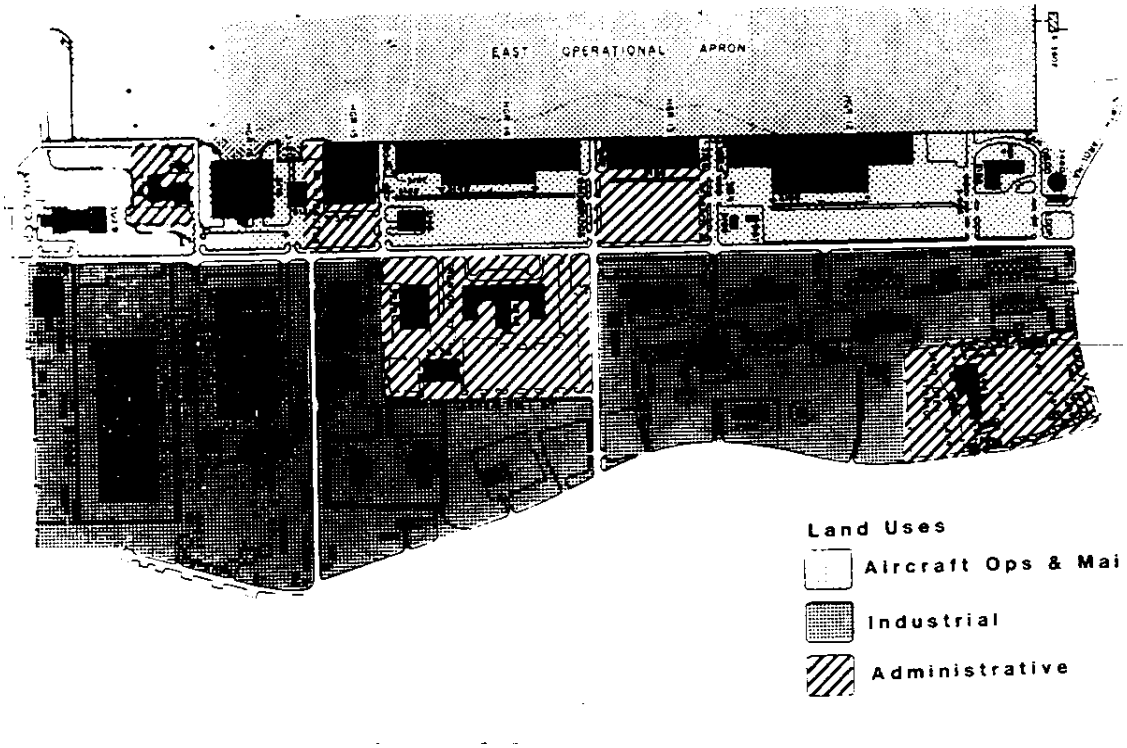


Figure 4-2. Existing Land Use

f. The potential changes in security made possible by improved land use are shown in figure 4 -3. High security areas have been consolidated, incompatible uses have been minimized, and access to lower security areas has been improved.

g. The improved land use plan, figure 4-4, indicates how diverse functions on the base could :be consolidated. Significant improvements in efficiency would accrue from these improved relationships. Additionally, valuable flightline space is made available for future expansion, with the security benefit of removing privately -owned vehicle traffic from ...

Diverse Functions

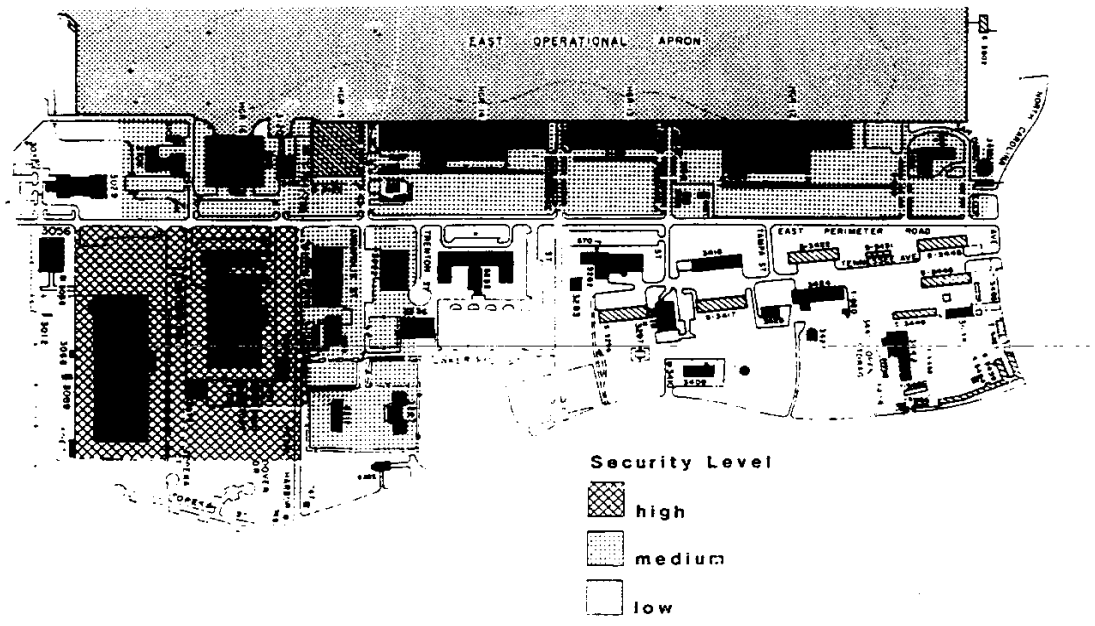


Figure 4-3. Security Changes

h. The security improvements for this base are clearly not obtainable in the near term. The cost and programmatic impacts of rearranging the base could not be justified solely for the purpose of enhanced security. However, just as this base has evolved to its current configuration over the past 40 years, so it can also evolve toward a more ideal configuration in the next 40.

Security Improvements

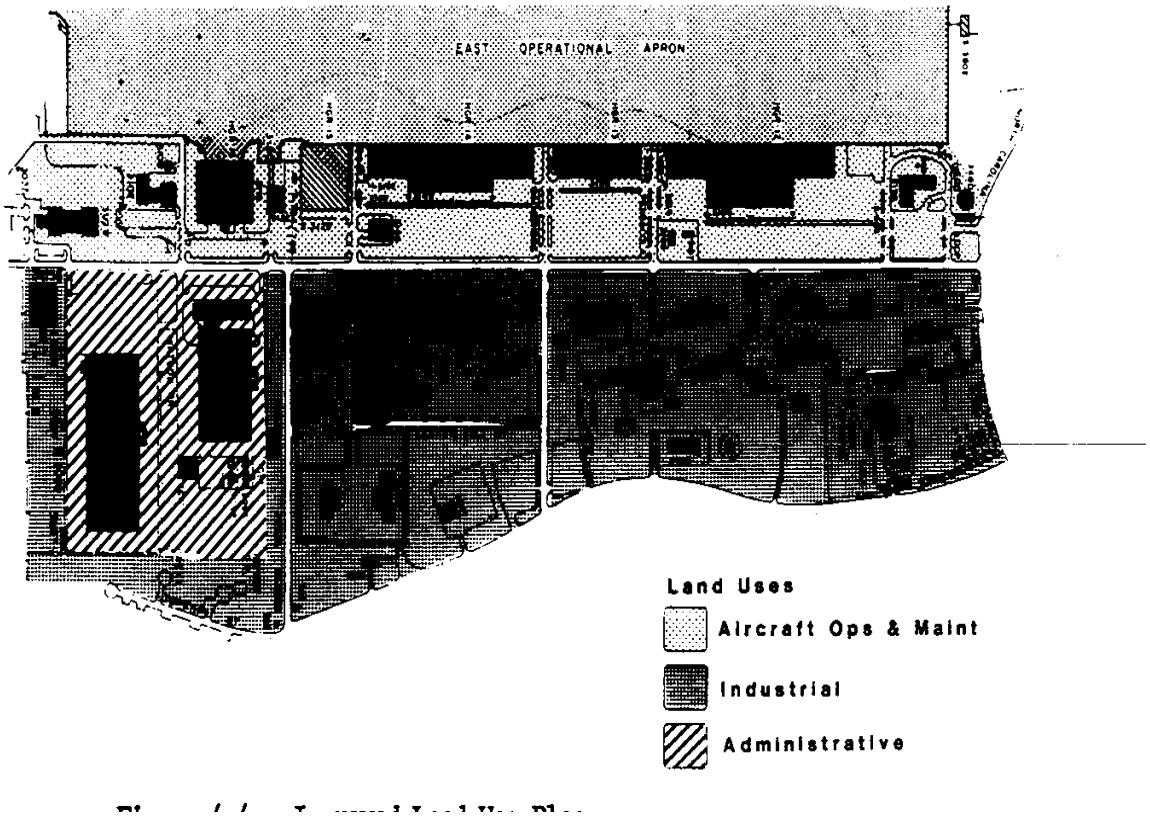


Figure 4-4. Improved Land Use Plan

4-4. Security Areas.

High Security Areas

a. High security areas (such as satellite communications sites and command, control, communications and intelligence facilities) should be kept as small as possible and away from the base perimeter (but not located in predicted, high potential primary target areas). By limiting their size, restrictive access requirements will have less impact on the total base. In addition, small areas with simple boundary configurations will require fewer perimeter improvements (less fencing, shorter patrol routes, and fewer perimeter lights).

Classification Levels

b. The classification level of secure areas should be as low as possible, consistent with the work protected. Artificially high levels of security unnecessarily restrict access, which can adversely affect productivity and efficient circulation. In addition, the physical improvements required by higher security levels (double fences, additional lighting, surveillance systems, added patrols, etc.) result in greater resource consumption and draw attention to the facility.

Compatible Activities

c. Functionally compatible activities of similar classification levels should be clustered together. This creates compact security areas, reduces the perimeter to be protected, and limits access points to serve the multiple activities (figure 4 -5).

However, at theater of operations locations, decisions to cluster facilities must be balanced by resource dispersal for survivability.

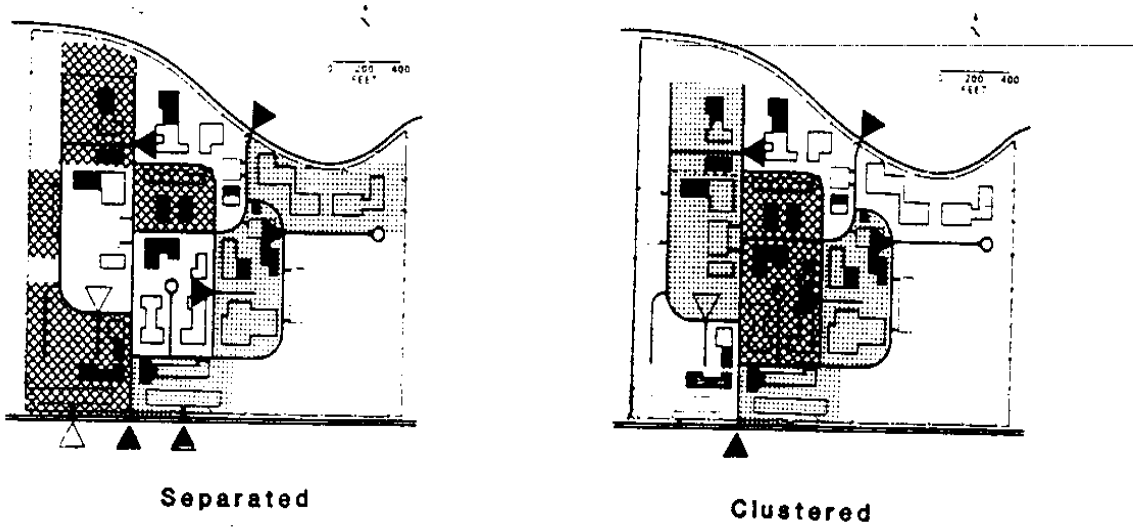


Figure 4-5. Security Areas

d. Large, high level security areas (Priority A - weapons storage areas, satellite computer/command and control sites, etc.) should be restricted to direct mission related facilities only. Administrative, community, recreational and industrial support uses should be sited outside of the controlled area. This reduces the number of people, supplies and contractors having access, reduces security police requirements, and enhances overall security.

Reduce Access

4-5. Utility Security.

Base Utilities

a. Mission accomplishment is heavily reliant on base utilities, particularly water and electricity. Dependence on insecure utility systems, such as exposed pipelines, overhead electrical distribution, and off -base water and energy supplies, make it apparent that our mission is highly vulnerable to disruption by terrorists, saboteurs, or disasters.

Survivability & Reliabilit

b. Planning utility systems should consider survivability and reliability. In high threat areas, utilities need to be redundant, dispersed and looped (figure 4-6) to enhance operability if damage (deliberate or accidental) occurs. By looping utility systems and providing the capability to

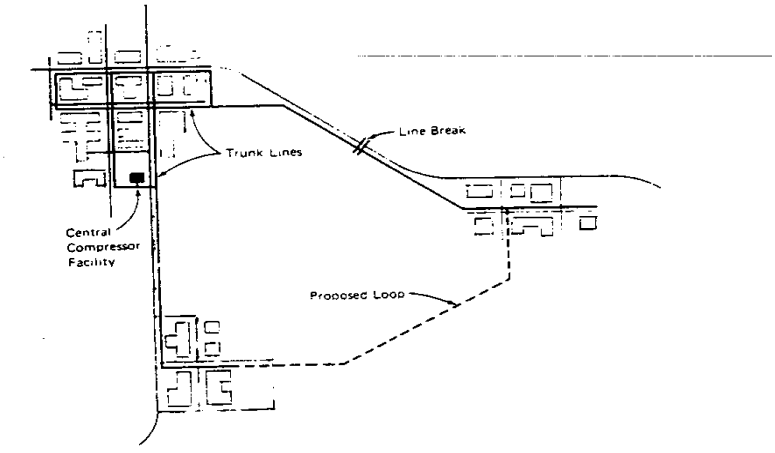


Figure 4-6. System Redundancy

isolate sections and runs of lines also helps in day to day maintenance and repair, minimizing total outage times, or even the need for outages.

Energy Supply

With regard to energy supply, installations should have generating capability, system redundancy, protection systems, and plans to minimize energy disruption. Energy supply, transmission, and generation systems must be as secure, survivable, and sustainable as the missions and mission assets they *support.*

d. The Air Force Energy Vulnerability Assessment Guide prescribes a six phase process for determining and correcting base energy supply vulnerabilities:

(1) Assess on-base energy vulnerability (storage, distribution, and *supply* systems) to define the affect of a plausible accident or conscious action on base energy supplies. Specifically, to what part of the base and for how long might on -base events effectively deny energy flows?

(2) **Assess off-base energy vulnerability** (commercial or community energy supplies) and develop plausible energy disruption scenarios for both on - and off-base energy supplies and systems.

(3) Assess the consequences of energy disruptions and develop corrective actions. In this phase, each base organization and tenant unit completes a self -evaluation of its own impacts from energy disruptions.

(4) Prepare an integrated analysis and report which describes existing on - and off -base energy vulnerabilities, potential critical mission impacts, and corrective measures.

(5) **Validate conclusions on energy vulnerability** through options and tests, including actual disconnection of subbase energy transmission 1i~cs and Inspector General tests.

(6) **Implement corrective measures,** includes adoption of actions, projects and programs to overcome identified deficiencies. These measures may include revised planning procedures and documents, current updates of the base energy vulnerability assessment report, personnel orientation and training, and requests for new equipment, projects and personnel.

e. Input from the energy vulnerability study to be the Contingency includes the identification of choke points and weak links on the utility maps (Tab G). Projects for system redundancy and hardening of exposed energy distribution systems and

equipment to enhance survivability also are considered. Relocation alternatives for energy substations, pumps, valves, etc., to more secure areas, and security upgrades for energy supplies, such as fencing, screening, barriers, detection devices and hardening are other considerations for the component.

C. Antiterrorism

4-6. Planning Methodology.

Potential Threats

a. Terrorism is a potential threat to USAF personnel and installations throughout the world. The dynamic and opportunistic nature of terrorism makes it difficult to define the character and level of threat. The objective of the Air Force antiterrorism program as prescribed by AFR 2~3 -1, is to reduce the vulnerability of personnel and facilities to terrorism while balancing defensive measures with mission requirements and available resources. The goal is not to "fortify" the installation, but to make it a less attractive target to a potential adversary.

Ability to Increase Protection

b. Since the nature of the threat is ever-changing, a basic level of security must be provided, with the built -in ability to increase or enhance the degree of protection at times of heightened tension or emergencies. The emphasis must be on

incorporating flexible and common sense protection when opportunities to do so are available. Security foresight and appropriate planning from the conceptual stages will limit the need for follow-on construction and unsightly additions, barriers and fences used to enhance security.

Early Planning

c. Since this document is concerned primarily with base development planning, facility design techniques and construction methods are not discussed. These subjects are presented in other documents (see Attachment 4, Bibliography).

d. A preliminary step in the planning of physical protection enhancements is the assessment of the local threat level and identification of potential targets of terrorist acts (figure 4 -7). Major factors influencing the type and level of protection to be applied at each installation are:

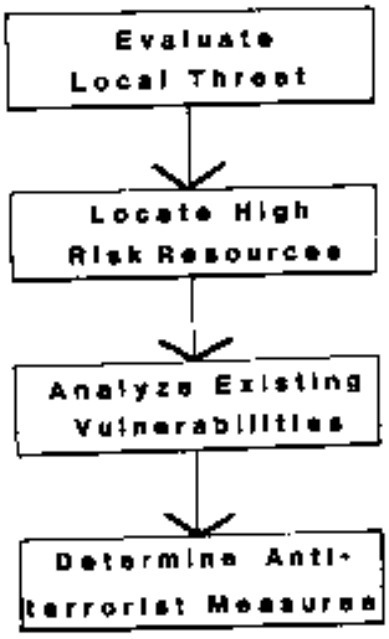


Figure 4-7. Antiterrorism Planning Process

(1) Local Threat Level. To determine the amount and type of resources needed for protective measures, an evaluation of the current and potential threat to the installation must be made. The local threat level will be determined by the servicing Office of Special Investigations detachment.

(2) High Risk Resources. These resources (people, facilities and systems) may be subject to attack because they are operationally essential, highly visible,

accessible, or symbolic as a US military asset, or critical to the function of the installation. High risk resources should be determined in coordination with the base security police.

(3) Existing Vulnerabilities. Because terrorism was not a major factor in the planning and construction of most existing Air Force bases, many critical facilities are vulnerable to terrorism and should be analyzed for possible threat mitigation. Examples include alert aircraft parked near public highways, headquarters buildings located adjacent to access gates, and fightline areas with unobstructed vehicle access from base community support activities. Other vulnerabilities may exist due to characteristics of the natural terrain, vegetation, surrounding buildings and land uses, which can provide cover, surveillance positions, or covert access for adversaries. Once these characteristics are known, they can be avoided or used to enhance protection.

Critical Facilities

4-7. Planning Guidelines. The following factors should be considered when selecting a location for high risk resources or providing security measures for existing resources:

High Risk Resources

a. Land Use and Facility Siting.

(l) Provide as much open space as possible inside the fence along the base perimeter.

Outside Observation

(2) Avoid areas with adjacent high terrain, vegetation including potential agricultural crops), or structures that allow outside observation (figure 4 -8). The existing or proposed structures on property adjacent to the base, or high terrain overlooking the base, will require increased setback distance from the base

(3) {Look for topographic features such as drainage channels, ditches and ridges that could allow covert access (figure 4 -8).

(4) Identify utilities, such as culverts and sewers that could allow access to the installation.

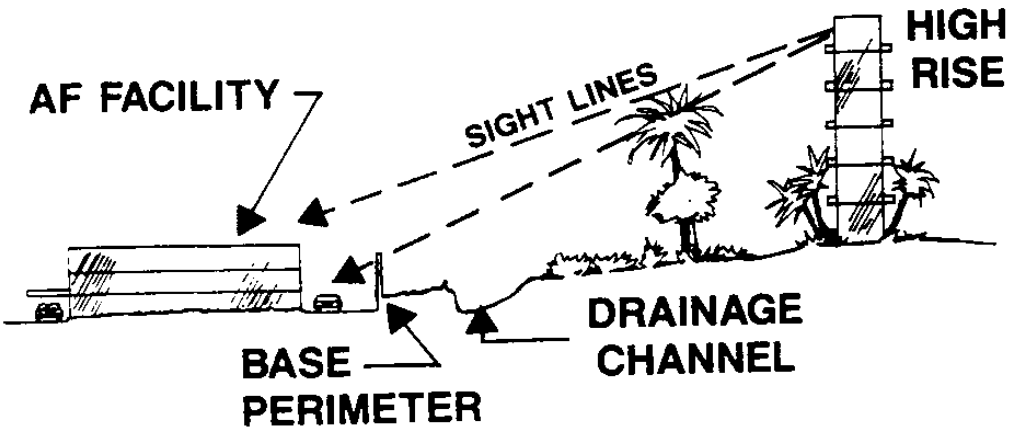


Figure 4-8. Incorrect Facility Location

Covert Activity

(5) Use landscaping to provide screening, but be careful not to create concealment for covert activity (figure 4 -9). Vegetation can have both beneficial and detrimental impacts on security. With proper placement or selective pruning, screening and field of vision can be effectively accomplished (see Chapter 6).

(6) Examine local land use and zoning plans for potential off-base development that would degrade security. On -base planning should consider possible off -base development.

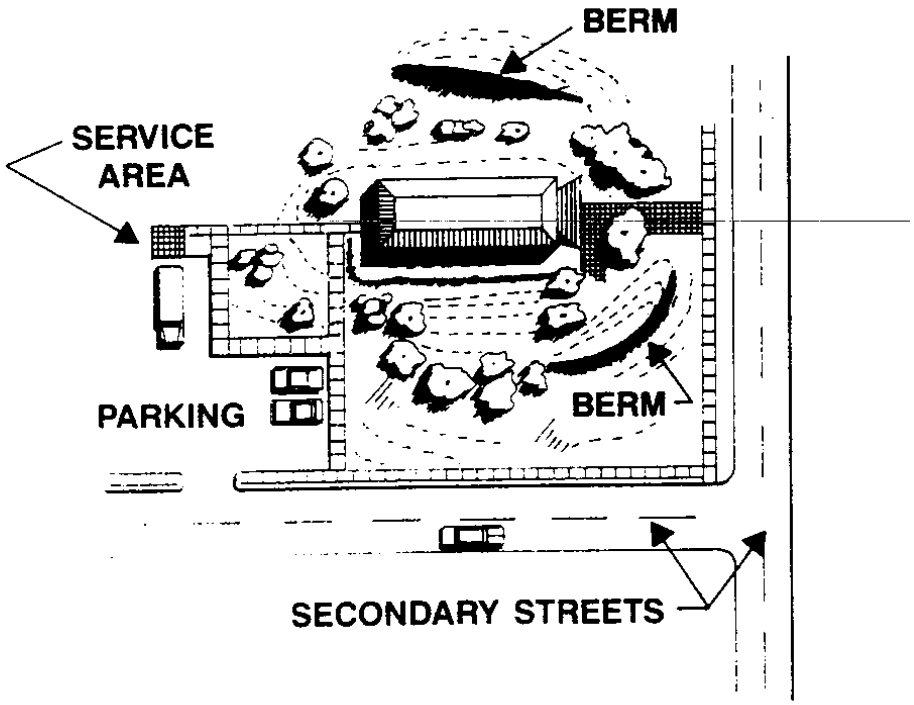


Figure 4-9. Correct Facility Site Planning

b. Vehicle Access and Circulation.

(1) Locate vehicle parking and service areas as far as possible from high risk resources (figure 4 -9). whenever possible, commercial, service and delivery vehicles should have limited entry to the base and a separate access point from operational, ceremonial, or other sensitive areas.

(2) Site high risk resources to the interior of the base, and remote from primary roads. Allow two methods of indirect access/egress to an from the facility (figure 4-9).

(3) Avoid long, straight access roads to high risk resources (figure 4 -10). Identify all possible approach routes, including paved, unpaved and overland, and plan so that direct vehicle access is avoided.

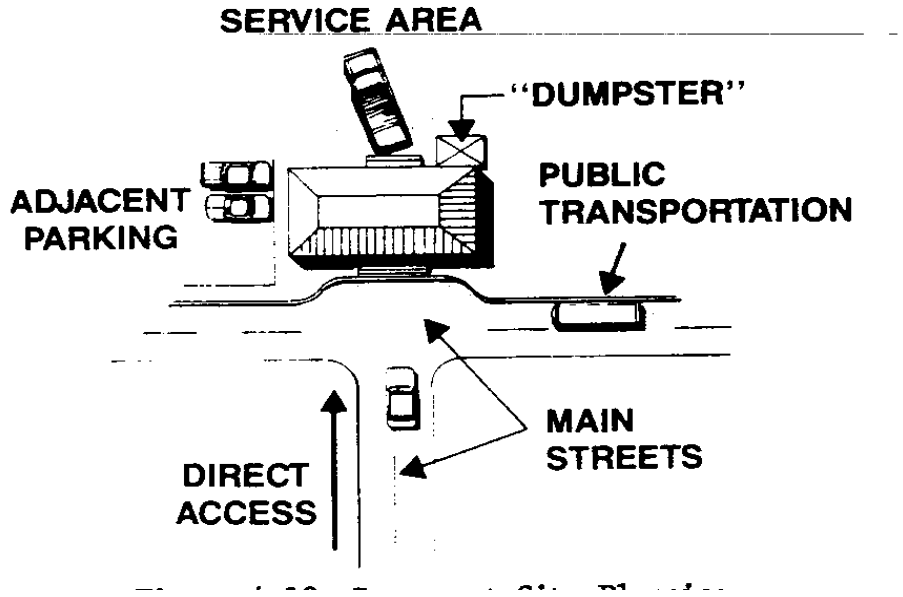


Figure 4 -10. Incorrect Site Planning

c. Defensible Space. The arrangement of buildings on an installation can enhance security by creating safe, efficient and manageable areas, making them unattractive targets for a terrorist (figure 4 11). These complexes of buildings, also termed "superblocks," are more defensible because they are defined by strongly delineated boundaries with buildings oriented to improve surveillance opportunities. An intruder becomes more noticeable and suspect in such an area. Additionally, vehicle traffic is eliminated from the interior of the building complex.

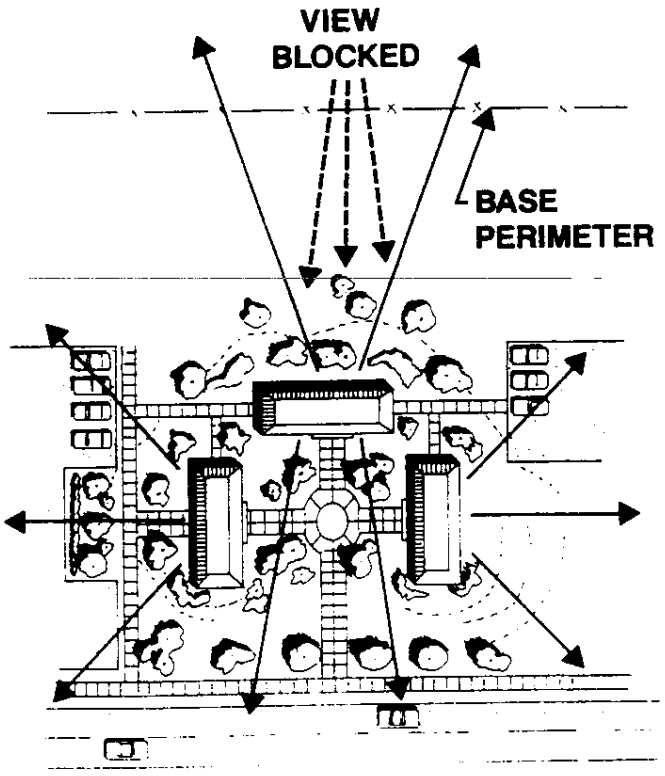


Figure 4 -11. Defensible Space

D. References

4-12. **Refer to the following documents** for information on physical security and anti-terrorism:

a. Air Force Energy Plan.

b. Air Force Energy Program Policy Memorandum 86-14.

c. Air Force Energy Vulnerability Assessment Guide.

d. AFR 28-31, USAF Base Support Planning

e. AFR 125-37, Air Force Resources Protection Program.

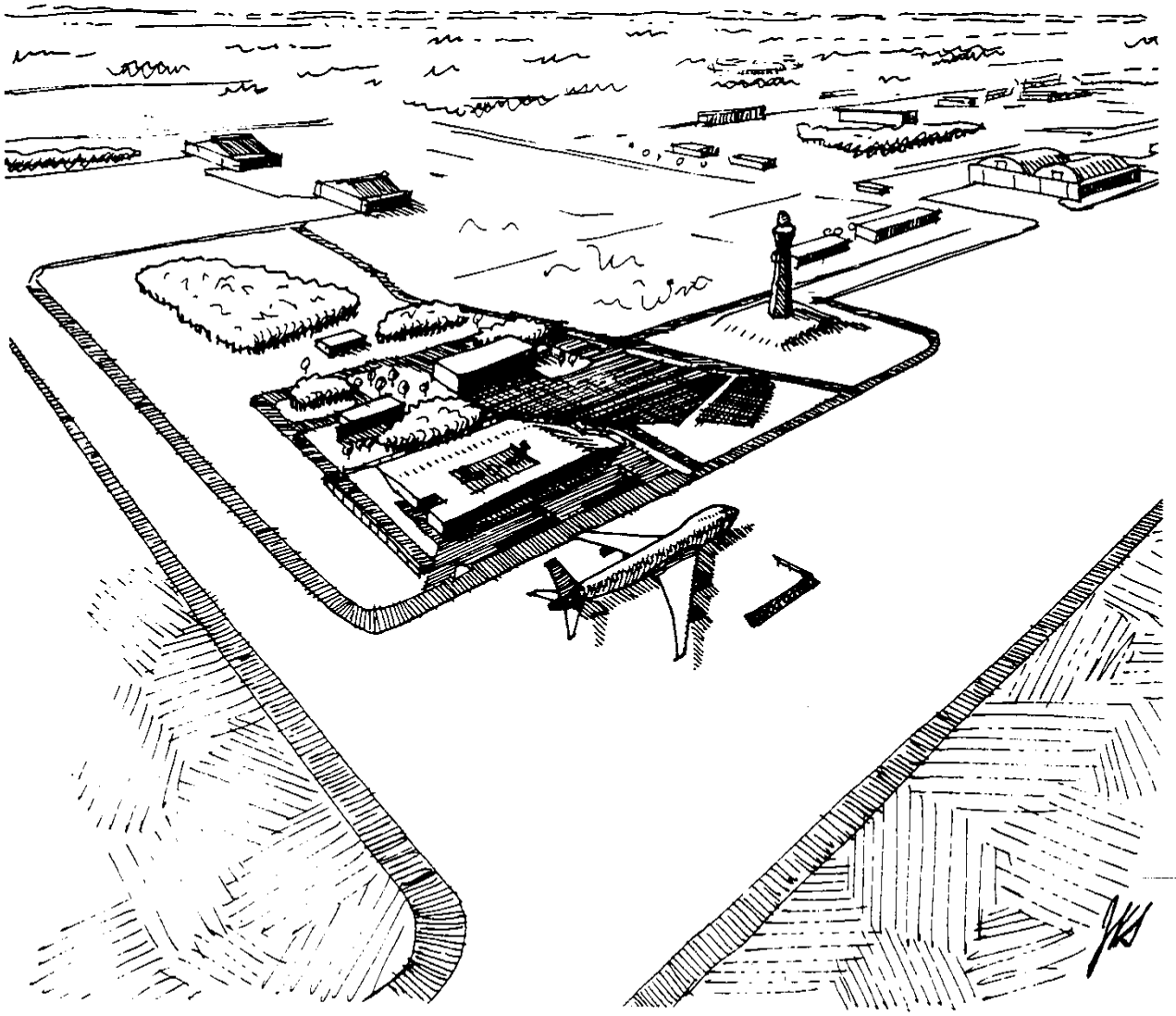
f. AFR 206-2, Ground Defense of Main Operating Bases, Installations and Activities.

g. AFR 207-1, Air Force Physical Security Program (U) (Confidential).

h. AFR 207-2, Nuclear Weapons Recapture Operations (U) (Confidential).

i. AFR 208-1, USAF Antiterrorism Program.

j. AFM 206-2, Air Base Ground Defense.



Chapter 5: PREPARING FOR EMERGENCIES

Chapter 5: PREPARING FOR EMERGENCIES

A. Disaster Preparedness Planning

5-1. Purpose and Scope.

a. Air Force installations are not immune from natural disasters or accidents, nor can an emergency on the base always be contained within the base limits. Disaster preparedness planning is designed to protect lives and property while maintaining, to the maximum extent possible, the mission capabilities of the base during a disaster.

b. Disaster preparedness planning addresses natural disasters, major peacetime accidents, and nuclear, chemical/biological, and conventional weapons attacks. Disaster preparedness is the detailed planning for prompt and effective response once a disaster occurs. It is the first step in mitigating the effects of disasters.

Disaster Mitigation

5-2. Disaster Preparedness Plan.

a. The base disaster preparedness office is primarily responsible for developing the disaster preparedness operations plan (OPlan 355 -1). This plan outlines actions to be taken by each base unit during potential disaster situations. The integration of OPlan 355 -1 into the BCP ensures that the

physical development of the base is consistent with and maximizes the response measures for potential disasters.

b. The BCP supports OPlan 355 -1 by providing the facility programming actions necessary to implement disaster preparedness requirements. For example, personnel protection shelters can be incorporated into proposed construction projects resulting fm m capital improvement plans.

Programming Actions

5-3. Environmental Plans. Pertinent environmental plans should be reviewed and updated as necessary. These plans include the installation Oil and Hazardous Substance Pollution Contingency Plan; the Spill Prevention, Control, and Countermeasures Plan; and the Hazardous Waster Management Plan. AFR 19-8, Environmental Protection Committee and Environmental Reporting, provides guidance for environmental compliance, safety and accident reporting procedures.

5-4. Natural Disasters. Natural disasters are emergencies resulting fm m wildfires, floods, earthquakes, snowstorms, hurricanes, tornadoes, severe thunderstorms, or similar catastrophes. The base's response during natural disasters is to minimize injuries and damage through prompt warnings, protection for facilities and aircraft, prompt treatment of injuries and the quick recovery of mission

capability. The base may also assist stricken local communities when civilian recovery resources have been exhausted or are inadequate to cope with the disaster.

5-5. Major Accidents. These are accidents involving aircraft, conventional and nuclear weapons, fuels, and hazardous material/waste accidents. The considerations in base comprehensive planning for these accidents are similar to those for natural emergencies. m e primary difference lies in the fact that most potential major accidents occur with little or no warning.

B. Planning Considerations

5-6. Potential Threats.

Evaluate Threat

a. The first step in preparing for disasters is to evaluate the potential threats unique to each base. Most of the information concerning local natural and accident hazards is well known; the potential affect of those hazards on the base may be less obvious. The Contingency Plan component should include a discussion of all possible hazards, as well as all existing and proposed mitigation measures.

b. Each base will be subject to certain hazards with varying degrees of impact, depending on the type of facility

construction, distance from the disaster, and response time. Working with the base disaster preparedness office, the planner should determine the local disaster potential and response procedures. Based on this information, the base comprehensive planning implications can be evaluated and developed by the planner.

Disaster Potential

c. The following information should be shown on the Tab 0 -3:

(1) Crash grid. This is used to locate the site of an accident.

(2) Existing and proposed personnel protection shelters and emergency operations shelters. Protective shelters are used to protect mission -support personnel and the general base population. Emergency operations shelters house mission -critical functions that must be manned on a 24 hour -a-day basis during emergency situations. Indicate the type of shelter, location, building number and capacity.

Shelters

(3) Evacuation routes. Include both vehicle and pedestrian routes.

Evacuation Routes

(4) Fire stations, main fire water valves, water storage tanks and ponds, and fire hydrants.

(5) Medical facilities and helicopter pads.

d. The Tab D -6 should include the following information:

(1) Floodplains. Indicate the 50- and 100 -year flood levels and flash flood channels.

(2) Steep slopes. Indicate areas with grades of 15% or greater.

(3) Earthquake faults and potential liquification areas. Also indicate the overall seismic zone for the region of the base.

(4) Hazardous materials/waste storage areas.

(5) Munitions storage areas and explosive quantity -distance safety clear zones.

(5) Runway clear zones and accident potential zones (Air Installation Compatible Use Zone study).

(7) Wildfire hazard areas. These areas include woodland, brushland, chaparral and grasslands.

(8) Petroleum, Oil and Lubricants (POL) storage areas.

Mitigation Techniques

e. Techniques for mitigating the effects of disasters include: incorporating special facility design and construction features, preventing or changing the characteristics of the hazards (such as building a levee to eliminate a flood hazard), predicting and warning of hazards, and avoiding sites which would be highly impacted. Disaster preparedness planning also involves other actions, such as restricting land uses in vulnerable areas, building barriers to reduce the effects of floods, and clearing brush to lower the threat from wildfire.

Land Use & Facilities

f. Tabs 0-3 and D-6 should ensure consistency between proposed base development and disaster preparedness issues. This analysis is the basis for preparing the future land use and facilities development plans. It may reveal the need to relocate critical functions from facilities sited in hazard areas, resite proposed facilities to less potentially hazardous areas, or redesign proposed construction projects to withstand the potential affects of disasters.

C. References

5-7. **Refer to the following documents** for further information and guidance:

a. AFR 19-8, Environmental Protection Committee and Environmental Reporting.

b. AFR 355-1, Disaster Preparedness Planning and Operations.

c. Natural hazards information can be obtained from:

Natural Hazards Research and
Applications Center
Institute of Behavioral Science
Campus Box 482
University of Colorado
Boulder, CO 80309.

d. Information on geologic hazards may be obtained from:

National Geophysics Data Center
NOAA, Code E/GC4, Dept. LUC
325 Broadway
Boulder, CO 80303
Telephone (303)497-6541 (FTS 320-6541)

Chapter 6: VEGETATION & LAND FORM FOR CAMOUFLAGE

Chapter 6: VEGETATION & LAND FORM FOR CAMOUFLAGE

A. General Guidelines

6-1. Definition and Purpose.

a. Integrating combat readiness objectives with comprehensive planning must include camouflage techniques. This chapter provides general guidance from a planning perspective on incorporating landscaping and land form considerations in base planning.

b. The goal is not to "hide" the base; base locations and configurations are well known. The primary objective is to confuse an attacker just enough to abort the mission or miss the target. Whether the attack comes from high *speed,* low level aircraft, or sabotage on the ground, careful site planning and placement of vegetation and land forms can help protect critical facilities.

Confuse the Attacker

c. Landscape development plans, exterior master paint plans, architectural design guidelines and other elements of base comprehensive plans, must be coordinated with wing tactical deception officers (TDO) having overall camouflage, concealment, and deception (CCD) management and planning responsibility. Therefore, base planners must be familiar with CCD concepts and

Tactical Deception

techniques and ensure that they are considered during facility siting, construction and landscape planning. Coordination of efforts supporting CCD planning will ensure maximum benefits and value for invested resources.

6-2. CCD Planning Concepts.

a. The primary objective of CCD is to defeat the target acquisition systems used against air base defenses, whether the attack comes from the air or the ground. CCD concepts and techniques are designed to counter threats posed by increasingly sophisticated tactical target acquisition systems.

CCD Concepts

b. The four concepts of CCD are hide, blend, disguise and decoy. Any effective camouflage plan will probably include more than one concept. It follows that a clear understanding of all concepts is critical to effective planning.

(l) Hide - complete concealment or screening of an object from target acquisition devices. Normally, any screen, whether natural or artificial, need only be tall enough to prevent direct observation from low flying aircraft or ground forces. The direction of attack is also critical in determining the degree of shielding (figure 6 -1).

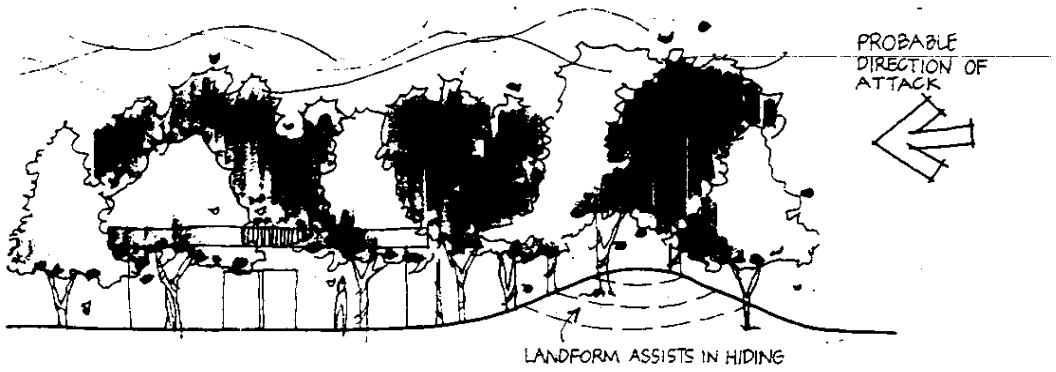


Figure 6-1. Hide (Wooded location)

(2) Blend - making an object look or appear to be part of the background. Blending normally involves defeating visual (tone-down), infrared (contrast reduction) and, to a lesser extent, radar target acquisition devices (figure 6 -2).

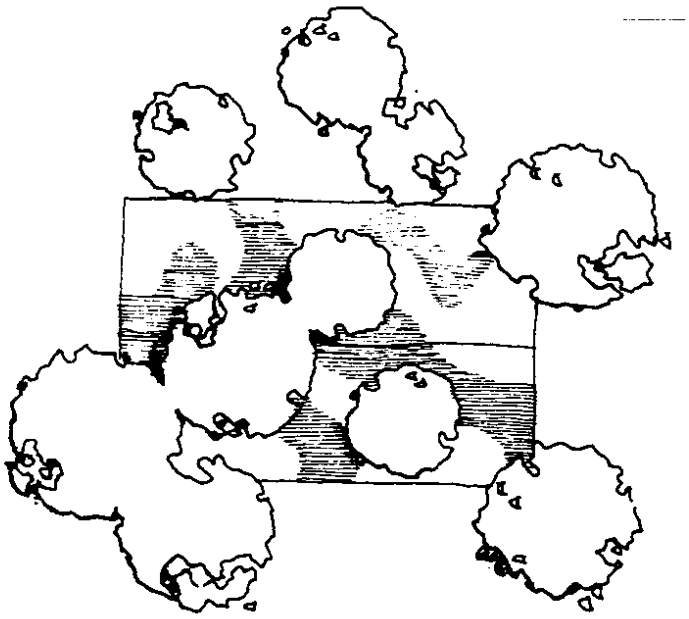


Figure 6-2. Blend (Painted roof)

(3) Disguise - devising a false appearance to mislead the attacker about the identity of the target. As an example, an aircraft shelter may be made to look like a barn (figure 6 -3).

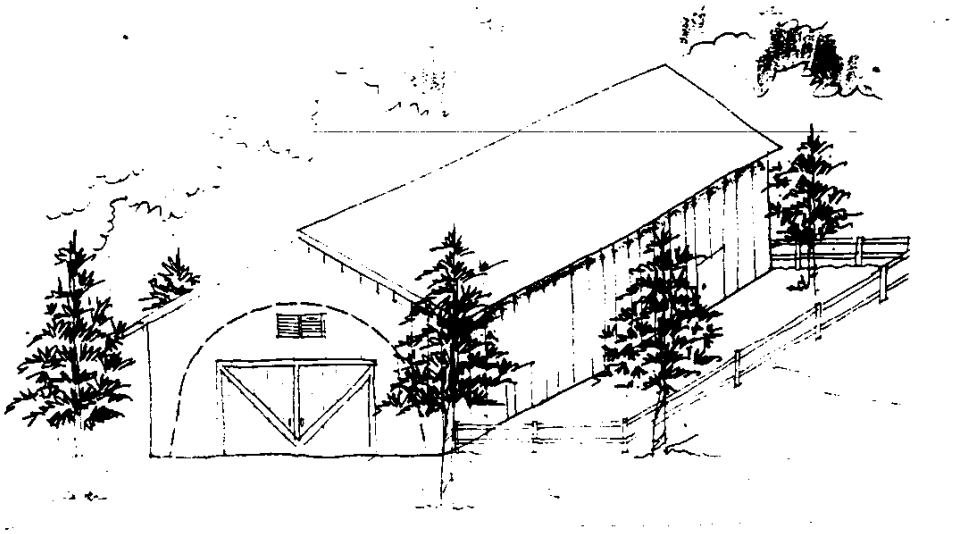


Figure 6-3. Disguise (Shelter disguised as farm building)

(4) Decoy - substituting false for real (figure 6 -4). m ere are two types of decoys which are common in CCD:

(g) First, realistic imitations of targets (for example, aircraft decoys) are placed at locations where they become effective false targets and weapon discharge will have minor impact.

(b) The second type concerns decoy roads or cues intended to disorient the

attacker who is looking for specific identification or orientation points, for example, roads, towers, or large natural features.

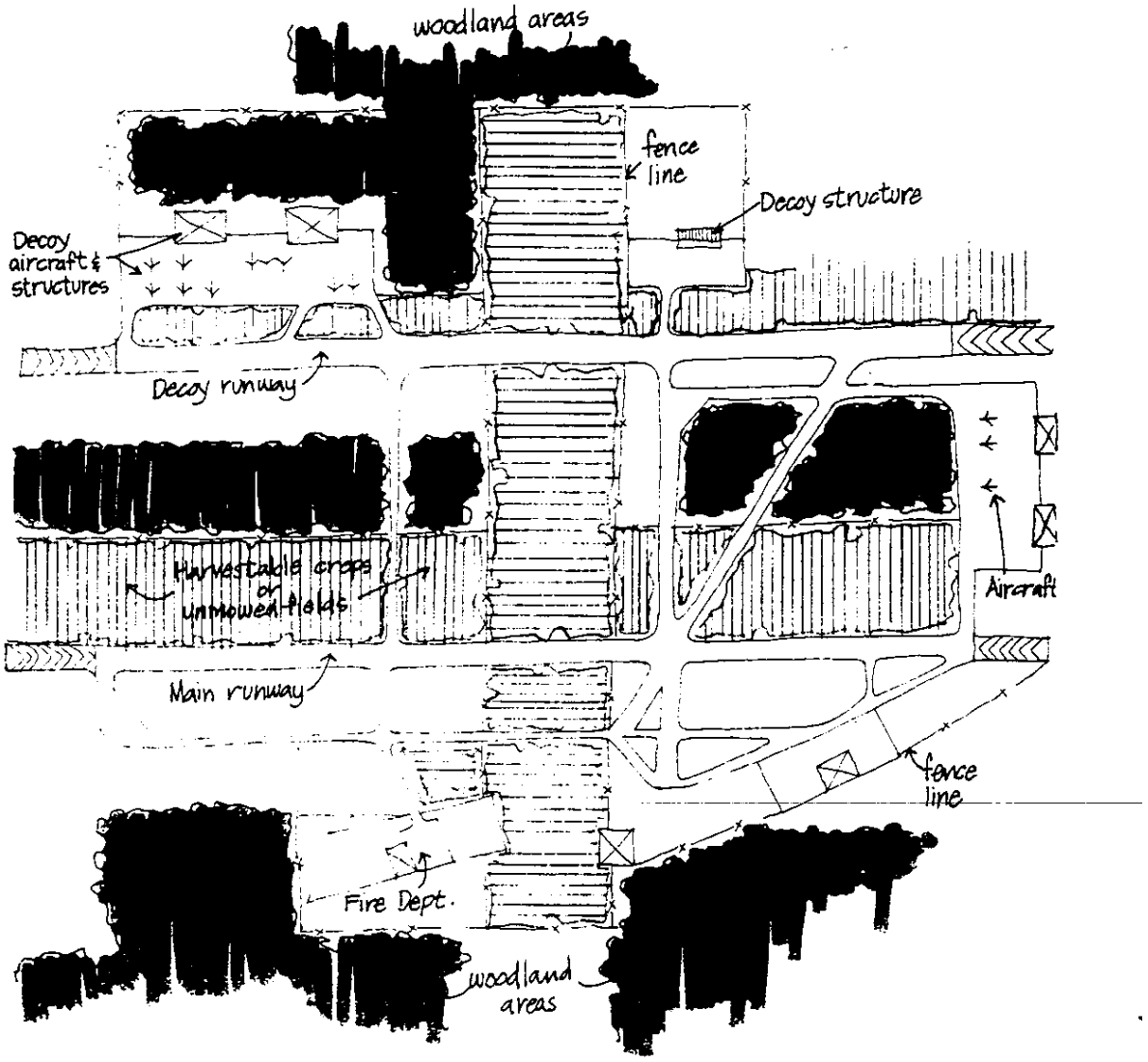


Figure 6 4. Decoy (Airfield targets disoriented to confuse attacker)

B. Program Methodology

6-3. Application Techniques. Once the four concepts of CCD are understood, they need to be consistently applied. The four techniques or methods of reducing visibility are siting, construction, natural camouflage, and artificial

a. Siting - Proper siting of new facilities contributes in reducing visibility of critical targets (figure 6 -5). Natural terrain and natural cover have been the major camouflage and concealment measures used throughout history. Preserving the local land pattern is extremely important. The planner should coordinate the 1ocation of

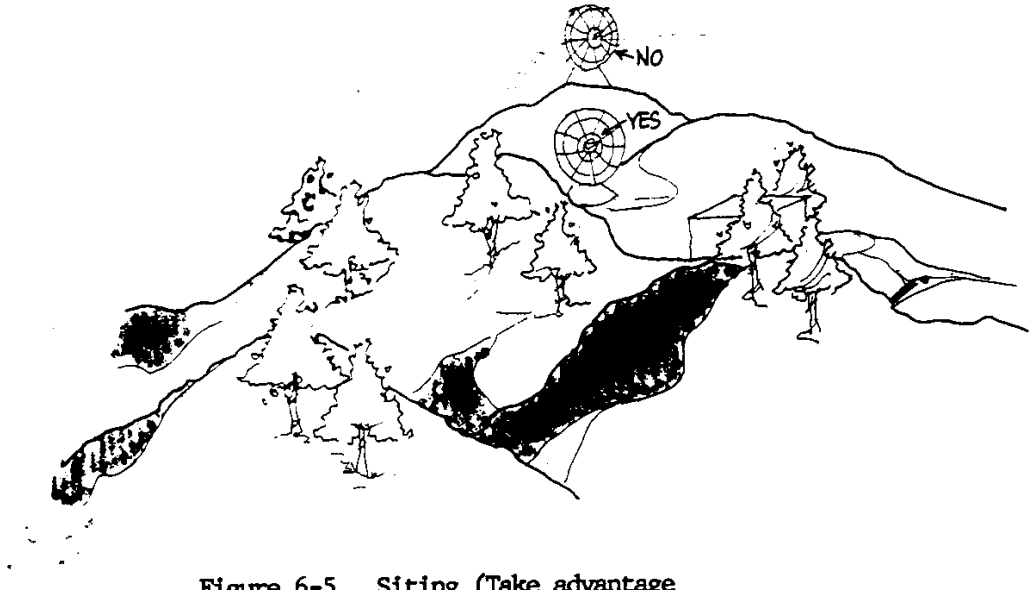


Figure 6-5. Siting (Take advantage

Figure 6-5. Siting (Take advantage of natural land form for cover)

any proposed construction or land form treatment with the wing TDO to maximize support for the base CCD plan.

b. Construction - If possible, new facilities should be designed to conform as closely as possible to local civilian structures. This will help mask characteristics common to military facilities. New facilities should be constructed in an areas away from conspicuous features of the installation such as water towers and warehouses, and sited to maximize the use of trees, vegetation, and natural terrain features to hide or blend.

c. Natural Camouflage - Vegetation is always the best overall camouflage method when it is used properly. However, consideration must be given to flight safety and security restrictions. Water can also be an effective infrared reduction technique when used to flood building roofs to reduce temperature. If water i£ to be used, plans must be made in advance for a distribution system.

d. Artificial Camouflage - Artificial camouflage should be used to reduce consciousness only if the effect achieved by siting, construction, and natural camouflage is not satisfactory. Examples of artificial] camouflage material include camouflage nets or screens, coatings (paints), textured surfaces, mats, and' shields.

6-4. CCD Planning. CCD planning must be based on an understanding of local geographic and climatic conditions. Area-wide and local topographic analysis to establish appropriate site character parameters is equally important in tailoring the plan to the specific installation. Natural camouflage and construction are two techniques that civil engineers can influence the most in support of a base CCD plan, and are discussed below.

a. Natural Camouflage:

(1) Type to Use. In using natural camouflage or vegetative concealment, basic cues must be taken from the region surrounding the installation. Selection of plant materials commonly found and locally available is vital to the success of the CCD effort. Maximizing camouflage, concealment, and deception from an aerial perspective employs the use of mixed tree forms and varieties which still allow ground level lines-of-sight. The use of shrubs should be minimized, from the viewpoint of overall CCD.

Use Local Plants

(2) How to Use. Employing clusters of trees around single and multi-story structures will visually conceal these facilities. Such tree groupings should extend beyond the immediate building perimeters and tie several facilities together. The area should appear natural in context with existing tree densities.

(a) The approach is to use tree varieties should be representative of natural combinations in the local vicinity. This will normally result in one primary species being used with only a limited number of other species of occasional "accents" in the composition, i.e., in an oak forest, or in a pine thicket.

(b) Trees used for concealing high value targets should -d be positioned to provide the best cover from the most probable direct2ons of attack;. A natural appearance needs to be created. (The wing TDO should be consulted to help determine the most probable direction of attack and resolve problem with the other aspects of the overall CCD effort before planting plans are formalized.)

(c) A regular pattern of tree placement should be avoided as this could provide visual signals or cues to the attacker. Aerial views of horizontal spaced surfaces and isolated equipment items can also be interrupted to a degree with foreground tree plantings, where appropriate.

(d) Identify and treat open, undeveloped parcels of land on base to replicate the surrounding regional character. This will help to conceal the base perimeter and blend it with the pattern of land in the vicinity. For example, a vacant parcel could be left natural or moved

and planted with perimeter hedgerows to appear similar to adjacent farmlands.

(3) When to Use. Tree plantings as CCD elements are most appropriate for installations set in regions containing existing natural woodlands or in urbanized areas that exhibit mature tree canopies when viewed from the air. In either case, introducing extensive new tree planting enhances the CCD effort. This should be considered for both theater of operations and CONUS locations.

(4) Other Considerations. To be effective, the vegetative portion of the base CCD plan must be sensitive to operational, security, and safety requirements. Proper clearances for aircraft and equipment operations, defensive and offensive security actions, and facility access needs must be considered. This demands coordination by all concerned. m e overall base landscape development plan for the installation must support and reflect identified needs of the base CCD plan.

b. Construction (Land Form):

(1) Type to Use. New structures look more natural when the site design complements the existing terrain and vegetation. Because the construction

process disturbs existing conditions, repair or re-creation to the original site character is important. Like vegetation, land form can add to the finished or established look of a newly constructed facility and greatly aid in its concealment.

(2) How to Use. Concealment of structures with earth forms can be accomplished by partially or totally "sheltering" the facilities by mounding or berming. The exterior walls become retaining walls, allowing portions of the structure to be buried or concealed below grade, resulting in a reduced visual profile.

(a) Total exterior sheltering of facilities can be accomplished by an earth cover. In these -cases, interior atrium spaces can be designed for the benefit of the occupants.

(b) Concealment of exterior equipment storage, aircraft, and vehicle parking areas can be aided by using earth berms to provide ground level screening, and in concert with tree plantings, to interrupt aerial identification] of these sites.

(c) In each instance, the earth forms should conform to the land character of the immediate region and not be contrived or rigidly geometric if they are to successfully achieve concealment. Creating softly

contoured, gently sloping earth forms simplifies maintenance and reduces opportunities for intruder concealment.

(3) When to Use. Undulating terrain offers excellent opportunities to use mounding or berming to hide a facility. In these areas, new facilities should be designed to blend into the site with minimal disturbance to the existing environment. In heavily vegetated areas and even desert situations, total earth sheltering of new facilities By be the ideal approach in the attempt to maintain original site character while achieving concealment.

(4) Other Considerations. The total planning effort expressed by the base CCD plan must include the use of land form. Design of new facilities should consider this from the beginning, as a matter of standard practice. Modification of the land form on the sites of existing facilities must also be considered to advance CCD goals. For existing mission essential facilities, the added investment for land form site modifications can be worthwhile if it increases survivability. In other cases, use of vegetation might be the most cost effective means.

(5) Note: Architectural design features can be very important from a CCD standpoint to accomplish the goals of hiding or blending, and should be considered early

in facility design process. However, a full discussion of design considerations is beyond the scope of this guideline (see Reference 6-7a for additional information).

C. Conclusions

6-5. Vegetation Maintenance.

a. Selectively using low maintenance vegetation minimizes or eliminates the need for future maintenance. Attentive maintenance to new plantings during the first 2 to 3 months is critical to success of plant growth and development. This maintenance should include watering; applying such sprays and invigorants as are necessary to keep materials free of insects, diseases and in healthy condition; resetting plants to plumb positions as needed; and re -guying trees as necessary.

b. For existing lawns, maintenance includes repair of eroded areas; replacement of weak, sodded, or seeded areas; and weekly mowing and edging. Where land form modifications have been introduced, maintenance includes repair of eroded grades. Periodic maintenance is vital to the success of this CCD effort.

6-6. Added Benefits. Beyond the basic achievement of CCD goals by the use of

natural camouflage and construction, the following benefits are also realized:

Energy Conservation

a. Energy conservation is a primary benefit derived from the use of trees to shade structures, thereby lowering temperature levels. Alternatively, the use of deciduous trees allows the winter sun to reach these same surfaces, providing a warming effect during winter. Structures which are partially or wholly earth sheltered realize even greater energy savings from the insulating effect of the soil mass.

Blast Effect

b. Vegetative massing and earth sheltering also provide inherent blast effect reduction from both an internal and an external standpoint. Their physical masses act to provide a degree of containment and protection of surrounding facilities and individuals should an internal blast occur and, in reverse, achieve a degree of protection for the sheltered facility from external blast forces.

c. On a day to day basis, a certain amount of noise reduction and control from both internal and external sources is also achieved by the use of vegetative massing and earth sheltering.

D. References

6-7. **Refer to the following documents** for information on camouflage techniques:

a. Air Base Camouflage Techniques Report, October 1984, HQ Armament Division (AFSC), AD/YQ, Eglin AFB, FL.

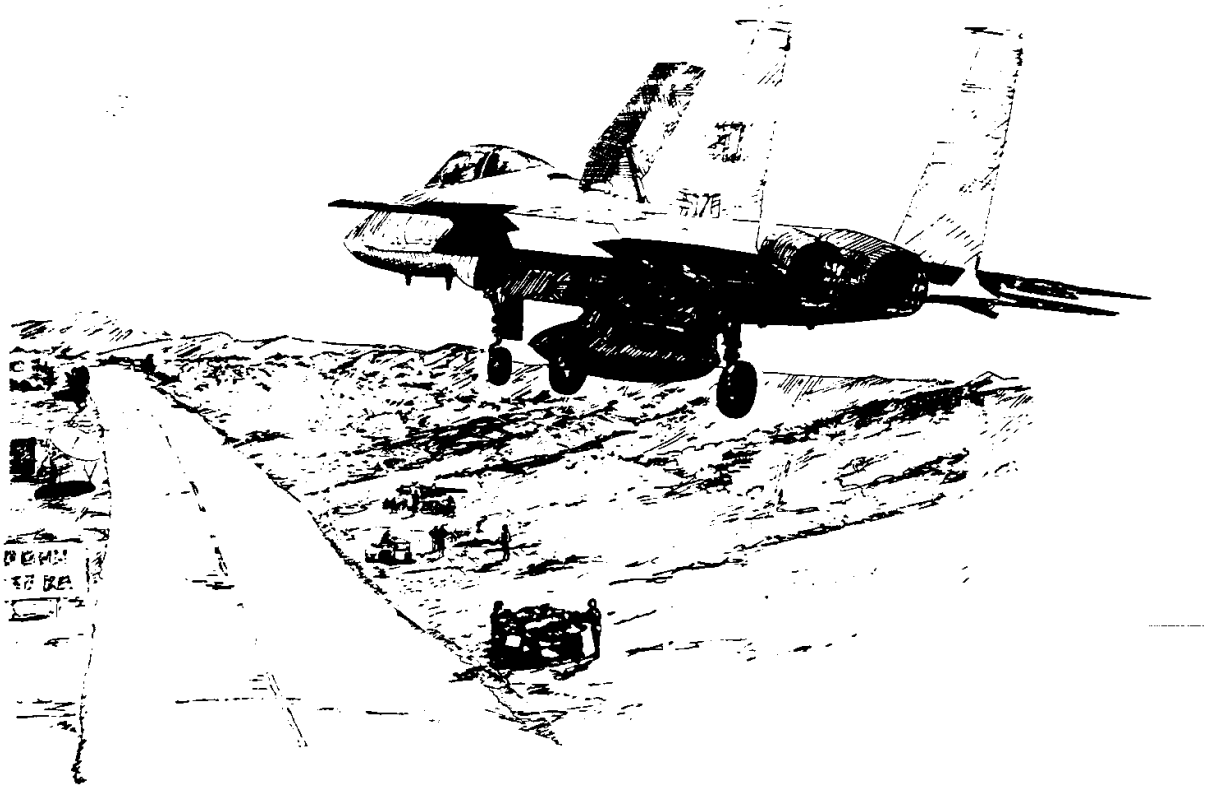
b. Dusty Demo: Camouflage, Concealment, and Deception Demonstration, Final Report, January 1988, USAF Tactical Air Warfare Center, Eglin AEB, FL

c. AFR 55 -49, Tactical Deception.

d. Security Classification Guide, Air Force Tactical Deception Program, May 1986.

e. AFP 86 -10, Landscape Planning

f. AFP 93 -2, Contingency Response Procedures.



ATTACHMENTS

Attachment 1: Glossary
Terms sad acronyms used in this handbook
and not otherwise defined in the text

ACTIVE DEFENSE - the employment of limited offensive actions and counter -attacks to deny a contested area or position to the

AIR BASE OPERABILITY (ABO) - Those measures necessary to integrate the wartime operational requirements of all base functions to defined against, mitigate the effects of, and recover from hostile action. The overall objective of ABO is to sustain sortie generation capability to continue employment of Air Power (AFR 360 -1).

AIRFIELD - The runway, taxiway, hardstands, apron and other pavements, associated open space -, navaids, aircraft arresting systems, airfield lighting and marking, overruns, approach zones and clear zones for the accommodation, landing and takeoff of aircraft.

AICUZ - Air Installation Compatible Use Zones, (1) land areas on which certain uses may obstruct the airspace or otherwise be hazardous to aircraft operations, and (2) land areas that are exposed to the health, safety, or welfare hazards of aircraft operations (AI W Z Handbook).

AIRFIELD/AIRSPACE CRITERIA - Imaginary clearance surfaces associated with airfield flight operations (AFR 86 -14).

EASE COMPREHENSIVE PLAN (BCP) - The plan for the short - and long -range development of a base. BCPs consist of Tabs (maps) and plan documents containing policies and guidelines to direct base planning and facility programming (AFR 86-4).

BASE SUPPORT PLAN - The wing/base commander's plan for

supporting the base's contingency tasking. It describes specific wartime tasks, responsibilities, capabilities, and limitations associated with the reception, beddown, and employment of deployed or transitory forces. It includes supporting tasks such as WRM out-movement and support of other bases and locations.

DEPLOY - To relocate a unit or an element thereof with all required personnel and equipment.

DISEERSION - The spreading or separating of troops, materiel, activities, equipment or facilities ~hicl1 are usually concentrated in limited areas, to reduce vulnerability to enemy

EMERGENCY OPERATIONS SHELTER - Protective structures which house mission critical functions that must be manned during emergency situations.

INFRASTRUCTURE - The above and below ground utility systems, communications network, and roads on an installation.

LIMITING FACTORS (LIMFAC) - A deficiency in resources required For the execution of an operation plan, such as movement capabilities, personnel, logistics, or facilities.

MOBILIZATION - The act of preparing for war or other emergency through assembling and organizing national resources. m e process by which the armed forces or part of them are brought to a state of readiness for war or other national emergency.

NAVAID - Navigational aid for aircraft operations.

OPERATION PLAN (OPlan) - Any plan for the conduct of military operations, in a combat environment, that can be translated into an operation order.

PASSIVE DEFENSE - Measures taken to reduce the probability of and minimize the damage caused by hostile action.

POM - Program Objective Memorandum, a document developed at HQ USAF, with major command inputs, which identifies the Air Force position on programs and funding levels needed to support Department of Defense established objectives and guidance.

PROTECTIVE SHELTER - Any structure not previously designated an Emergency Operations shelter which will be used for protecting mission support personnel and the general base population.

QUANTITY-DISTANCE (Q-D) - The safety clear zone surrounding a potential explosion site which is determined by the required separation between inhabited buildings and potential explosive sites, based on quantity mod type of explosives (AFR 127 -lOO).

RECEPTION PLANNING - The process of preparing for the reception, beddown, and support for continuing operations. The vehicle used to preplan base actions and to transfer essential information is the Base Support Plan.

SECURITY ZONES - areas of differing levels of security.

TERRORISM - Acts of aggression or violence against people or facilities committed by individuals or groups for political, military, psychological or other reasons.

USAF RESOURCES - Military and civilian personnel of the active and reserve components, land, facilities, equipment and supplies under the control of the Air Force.

WRM - War Reserve Material required in addition to peacetime assets to support the planned wartime activities reflected in the USAF War and Mobilization Plan.

Base Comprehensive Plan

WRIGHT-PATTERSON
AIR FORCE BASE, OHIO

COMPONENT PLAN O
CONTINGENCY PLAN

DRAFT

April 1988

WRIGHT-PATTERSON AIR FORCE BASE
BASE COMPREHENSIVE PLAN

COMPONENT PLAN O
CONTINGENCY PLAN

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WRIGHT-PATTERSON AIR FORCE BASE

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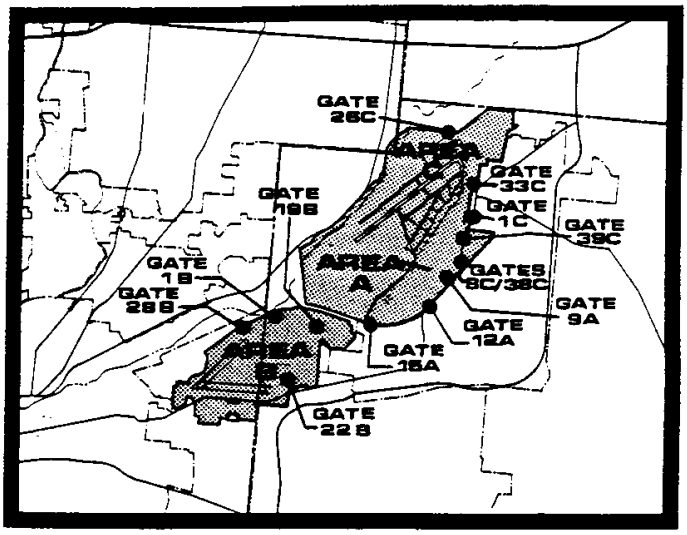

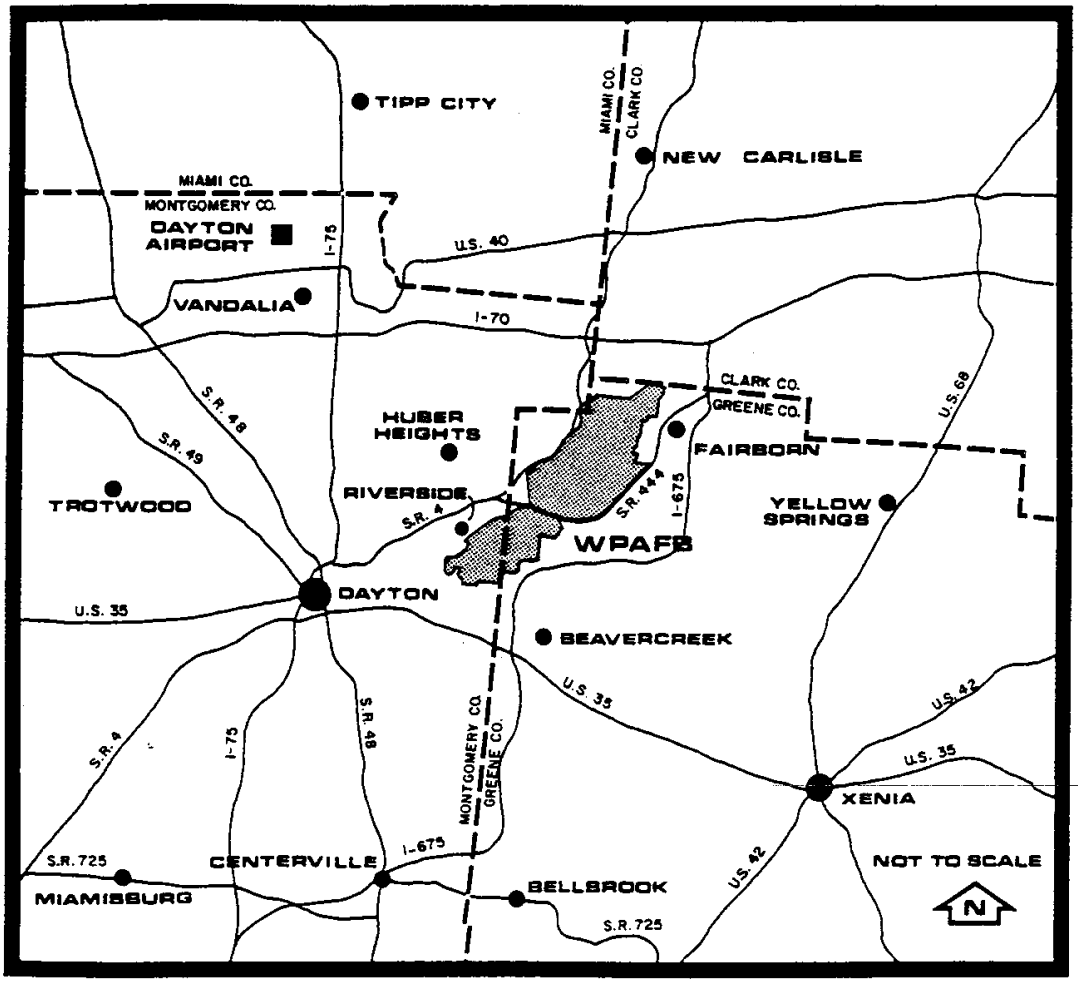

INTRODUCTION EXECUTIVE SUMMARY

Contingency planning means preparing for unexpected or unlikely emergencies that may occur with little or no warning. Contingency planning has been a central focus of overseas base planning for many years. Overseas contingency plans include survivability preparation, camouflage tone -down, dispersal (relocating forces to increase survival), hardening of facilities and bare base concepts. For a Continental United States (CONUS) installation like Wright -Patterson Air Force Base, contingency planning involves surge capability, physical security and disaster preparedness.

The Contingency Plan (Component Plan O) provides an overview of Wright -Patterson Air Force Base contingency planning efforts. The Contingency Plan reviews existing surge capability and physical security and disaster preparedness plans; it examines the needs and requirements of each plan; it offers alternatives for enhancing the plans; and it recommends additional policies or steps the base can take to ensure a quick, efficient and safe response to unexpected emergencies. The summary below includes the key issues and preliminary recommendations of the Contingency Plan.

SUMMARY OF KEY ISSUES AND PRELIMINARY RECOMMENDATIONS

The key issues identified below diminish the base's ability to protect itself and its personnel during an emergency:

The Aerial Port Work Center Is Poorly Located

The locations of the landside facilities and the Aerial Port Work Center would limit the operating efficiency of the airfield during a contingency. The primary runway and the Aerial Port Work Center are on opposite sides of the airfield, so aircraft must pass through a congested parking ramp, cross the secondary runway and follow a circuitous route when they taxi between the East Ramp and the primary runway. Aircraft must cross the primary runway to taxi from the East Ramp to Runway 5L. The Contingency Plan provides several alternatives to improve the taxiway system and the efficiency of the Aerial Port Work Center. The Plan suggests a secondary point on the West Ramp for mobility processing

Munitions Loading Will Be Improved by Using the New Hot Cargo Pads

The munitions storage and loading area at the intersection of Taxiways 14 and 17 is away from populated areas and easily accessible for truck deliveries. The location is poor, however, from the standpoint of air operations. The new hot cargo pads, which will be constructed west of Taxiway 8 and adjacent Huffman Prairie, will be better for airfield efficiency and will have ideal truck access from the Interstate 6751444A (I -675/444A) Interchange.

The Aerial Port Work Center Could Be Improved

Adding a drive -on scale would increase processing speed at the Aerial Port Work Center. Constructing a railroad loading and unloading dock and storage area behind the Air Cargo Terminal would allow direct train deliveries.

The Base Reception Plan Does Not Identify Alternative Gates

The base needs to identify access routes and principal points of entry in the Base Reception Plan . The Base Reception Plan (March 28, 1986) identifies Gate 26C as the prime entry and Gate 8C as the alternative prime entry but fails to identify other gates that will be kept open during a contingency. The Contingency Plan offers three alternative access routes and gates: state Route 235 and Gate 26C; I-675/SR 444A Interchange (to be constructed) and a gate to be named; and State Route 444 and Gate 8C. Any of these alternatives would make excellent access routes and principal points of entry under surge conditions.

Development Should Be Discouraged In Surge Areas

Development should be discouraged near munitions loading and unloading areas, the Aerial Port, direct -access routes between the gate system and the Aerial Port and in other areas where surge activities take place during contingencies. All open space not in the flood plain nor near fuel or munitions storage should be programmed for future development with the knowledge that this land might be needed for emergency or temporary facilities.

Several Security Problems Are Not Addressed By Programmed Projects

The base has programmed seven projects to increase security, but these projects do not address several additional security problems. These include correcting "soft" entry points such as Gates 12A, 18, 19B and 39C; relocating or reconfiguring parking lots less than 150 feet from sensitive facilities; fencing the loading dock at the base commissary, improving the ingress and egress routes for munitions and fuels; and increasing the number of security personnel.

SURGE CAPABILITY

REPORT NARRATIVE

I. INTRODUCTION

Contingency Planning Means Planning for Emergencies

Contingency planning means preparing for unexpected or unlikely emergencies that may occur with little or no warning. Contingency planning has been a central focus of overseas base planning for many years. Overseas contingency plans include survivability preparation, camouflage tone -down, dispersal (relocation of forces for the purpose of increasing survivability), hardening of facilities. For a CDNUS installation like Wright -Patterson Air Force Base, contingency planning involves surge capability, physical security and disaster preparedness.

II.

Surge Capability Planning Should Be Part of Long-Range Planning

Surge capability is an installation's ability to absorb and support an influx of military personnel, supplies, equipment and possibly dependents in an emergency. The surge could be for extended temporary duty, or it could be part of a permanent change of station in conjunction with a major build -up of defense forces. The surge might include mobilizing Air Force Reserve Forces, relocating active -duty personnel or both.

Surge capability requires a base -wide combined effort. The 2750th Air Base Wing (ABW) has primary responsibility, and the Base Reception Plan (Wright-Patterson Air Force Base, April 22, 19B5) integrates functional responsibilities. The base's surge capability derives from its ability to execute reception and mobilization plans promptly. Surge capability planning enhances base readiness and base efficiency during deployment. Capability planning also assesses the effects of possible closures on the base during a surge. A well-prepared surge capability plan integrates long -range planning and surge requirements into peacetime comprehensive planning goals and objectives.

A. Overview of Existing Surge Capability Plan

The Base Reception Plan Outlines the Existing Surge Plan

The base's surge capability plan in the Base Reception Plan outlines requirements for the reception, beddown and movement of units, people and materials during contingency/wartime operations.

Base Is an Aerial Port of Embarkation During a Contingency

During a contingency, the Air Terminal will become an Aerial Port of Embarkation (APOE) among CONUS installations for processing Military Airlift Command (MAC) personnel and cargo. A Base Reception Unit (BRU) and Munitions Reception Unit (MRU) will be formed to receive, process and support the forces. The BRU will process all units and individuals awaiting deployment, off-base units and base employees. The MRU will process all explosive cargo. The Air Freight Terminal (AFT) will process all non-unit cargo arriving for trans -shipment.

Base Reception Plan Constrains Land Use t

During a contingency, all open space will be available for temporary facilities, storage or bivouac; however, open space in the flood plain or near fuel storage areas, loading zones or munitions areas should be avoided. The base's two golf courses are not presently used as bivouac training sites because of the destructive effect such use would have on the condition of the golf courses.

When implemented, the Base Reception Plan poses major land use constraints on a) munitions loading/unloading, b) transportation and storage, c) Aerial Port operations and d) bivouac areas. These are discussed below.

(a)Munitions Loading/Unloading

Base Reception Plan Identifies Three Loading and 12 Unloading Sites

The Base Reception Plan designates 12 munitions unloading sites on Taxiways 12 and 17 and three munitions loading sites at the intersection of Taxiways 14 and 17 (depicted on TAB 0 -1 and in Fi gure 1). From a safety standpoint, the unloading sites are well located: they are far from any major population concentrations, sensitive facilities or irreplaceable equipment. From the standpoint of airfield operation, however, these locations can interfere with aircraft taxi flows, particularly when aircraft are departing on Runway 5L. Aircraft arrivals on Runway 23R also will be adversely affected by unloading activities at these two taxiway locations.

Munitions loading and unloading would be more efficient away from the taxiway system that serves the primary runway.

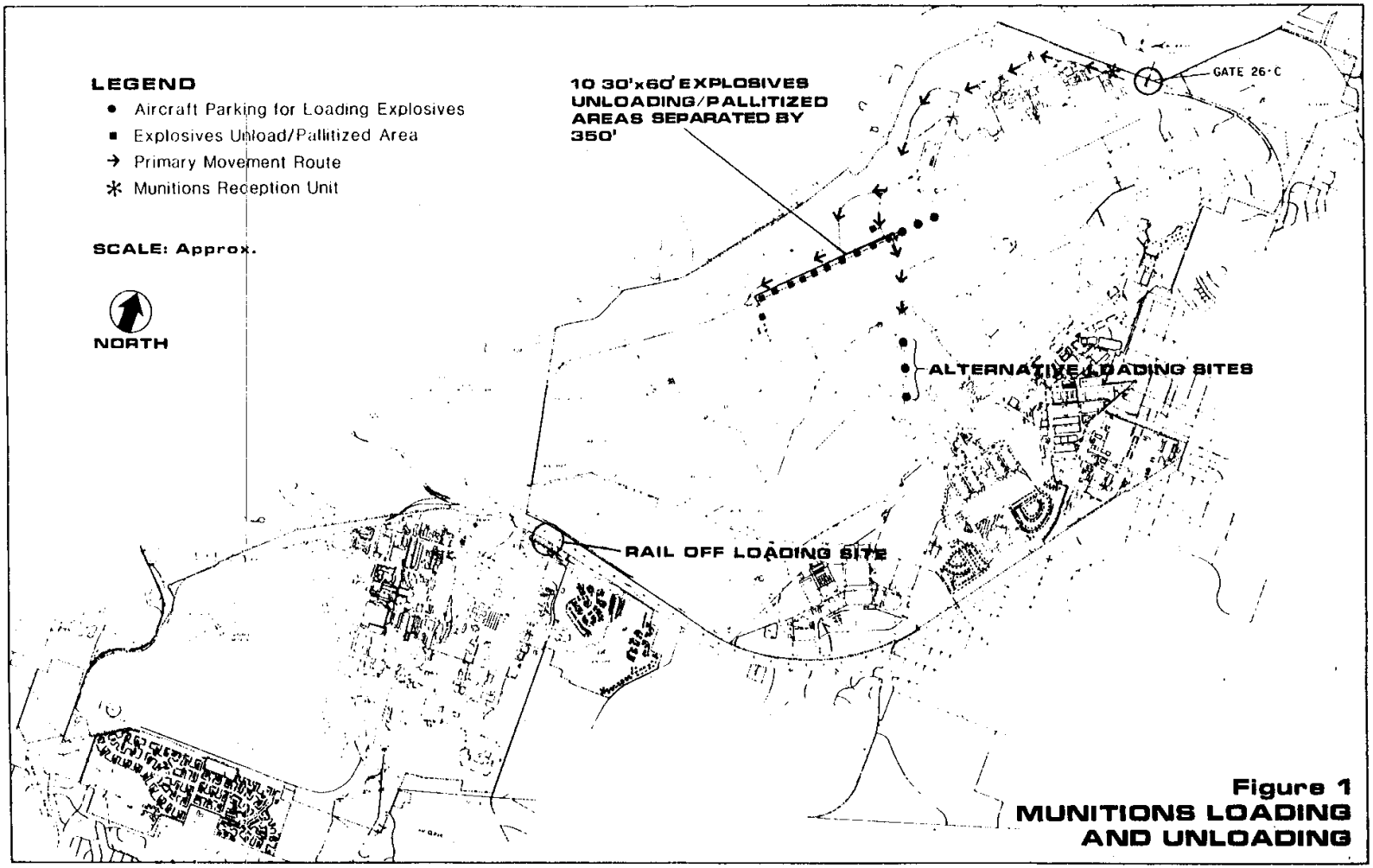

Figure 1
MUNITIONS LOADING AND UNLOADING

(b) Transportation and Storage

Base Reception Plan Identifies Routes for Trucks and Trains Transporting Munitions

All trucks transporting munitions are routed through Gate 26C to the MRU in Building 4001. From Building 4001, munitions are transported to either the primary munitions in -check on Taxiway 17 or to the alternate munitions in -check on Taxiway 12. Both routes avoid major population concentrations, sensitive facilities and irreplaceable equipment.

Munitions arriving by rail are unloaded near Building 743 in Area B. From Area B, the munitions are transported by truck to either the primary or alternate munitions in -check area. This route also avoids major population concentrations, but part of the route on Kauffman Road passes close to several facilities and to civilian automobile traffic. Building 743 is not an adequate site for this type of activity.

(c) Aerial Port

Base Reception Plan Provides for Four Aerial Port Work Centers and 5everal Support Facilities

The base is a stand -by CONUS Aerial Port that will become an APOE or an Aerial Port of Debarkation (APOD) during a contingency, national mobilization or national emergency.

The APOE will function jointly with the logistics airlift (logair) network and the MAC strategic worldwide airlift force to receive, marshal, process, load and unload all deploying or redeploying unit equipment, non -unit equipment and personnel for strategic airlifts. Major workloads are anticipated throughout the airlift movement. The volume of airlift in and out of the base is expected to require full operational support.

The Base Rece ption Plan provides four main Aerial Port Work Centers and support facilities described below and depicted in Figure 2.

Transportation Readiness Control Center Manages Information Flow

The Transportation Readiness Control Center (TRCC) in Building 142 is the focal point for information relating to traffic flow. The TRCC receives, processes and provides

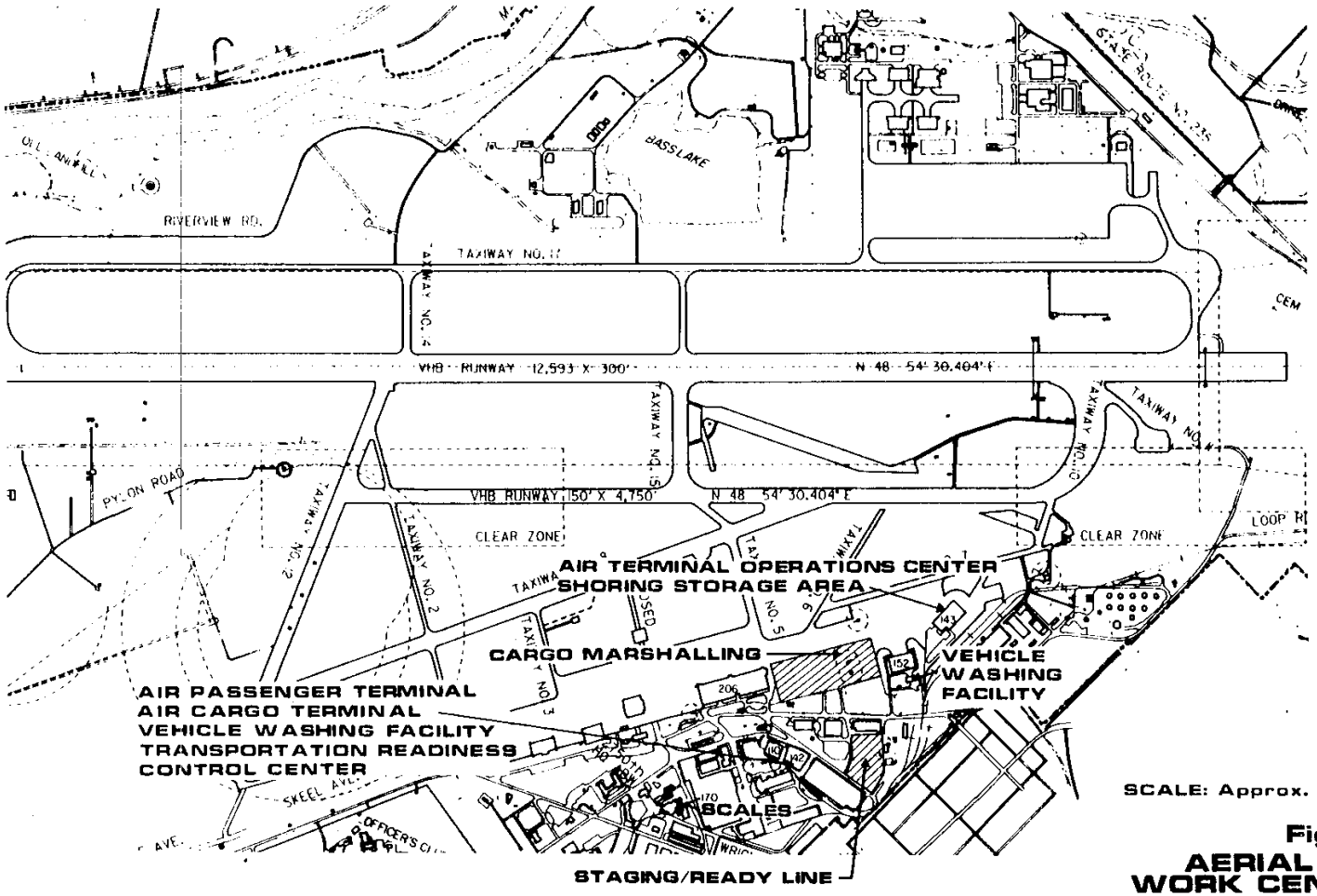

Figure 2
AERIAL PORT WORK CENTERS

the necessary information to schedule personnel and equipment for each terminal work center, including the MRU.

Air Passenger Terminal Escorts Personnel to and from Aircraft

During a contingency, the Air Passenger Terminal (APT) is moved from Building 206 to Building 142. The APT receives, processes and escorts passengers to and from aircraft. The APT ensures timely reception of deploying forces who arrive at the Aerial Port of Embarkation by various modes of transportation.

Air Cargo Terminal Receives and Processes Cargo

The Air Cargo Terminal (ACT) is on the ramp across from Building 142. The ACT receives and processes cargo for shipment. After processing, ACT notifies the Air Terminal Operation Center (ATOC) in Building 143 of cargo availability. ATOC ensures the timely loading of support aircraft.

Marshalling/Joint Inspection Areas Ensure Cargo Documentation

The Marshalling/Joint Inspection Areas, between Buildings 152 and 206, are staging and assembling sites for cargo and rolling stock by load sequence. Cargo is inspected for proper documentation, labeling, marking or certification.

Support Facilities Include Scales, Shoring Storage and Vehicle Washing

Other important Aerial Port facilities include portable scales and drive -on scales adjacent Building 170, a shoring storage area adjacent Building 143 and vehicle washing facilities in Building 142 and Buildings 55 and 151 (not shown).

(d) Bivouac Area

Base Reception Plan Establishes Two Bivouac Areas in Area C

Billeting facilities (housing) for individuals and units will permit Air Force transiting forces to remain close to unit equipment. No billeting will be provided for departures within 12 hours of arrival. In addition, the Base Reception Plan establishes two prime bivouac areas, or temporary encampments, for Army troops awaiting deployment

(shown on TAB 0 -1 and in Figure 3). These bivouac areas are adjacent the Petroleum, Oil and Lubricants (POL) Storage, the Prime BEEF area and the east end of the main runway. Army units will set up bivouacs at each unit's discretion. Army units will be fed on an emergency basis with the assumption that they will eat organic field rations during short stays.

In general, bivouac areas must be located near the Aerial Port and hardstand areas and must be large enough to preserve unit integrity. These areas should be accessible to major utilities, paved roads and main gates. Siting should avoid danger areas such as flood plains, fuel storage areas, loading zones and munitions areas. The base's two proposed bivouac areas are analyzed below.

The First Bivouac Area Is Accessible to Aerial Port, But Part Is Programmed for an Army Reserve Facility

The first area is near the POL storage and Prime BEEF facility. Adjacent Loop Road, this site offers proximity to the Aerial Port and contains some tree cover. However, this area is also adjacent the POL storage facility, and the risks associated with hazardous fuels diminish the suitability of the area.

Part of this site is programmed to be an Army Reserve facility. The proposed facility will decrease space for bivouacs. This could adversely affect unit integrity because an entire unit would not be able to bivouac together.

Second Bivouac Area Is Larger But Farther From Aerial Port

The second area is farther east along Loop Road. It is larger than the first bivouac area. This second bivouac area is farther from the Aerial Port than the first area but closer than any other potential bivouac area. The second bivouac area offers access to Loop Road and is large enough to handle a large number of troops. However, the area has no tree cover, so it is exposed to snow, rain and wind. This site also lacks utilities.

B. Needs and Requirements

Required taxiway improvements and key points of entry are major deficiencies in surge capability at the base.

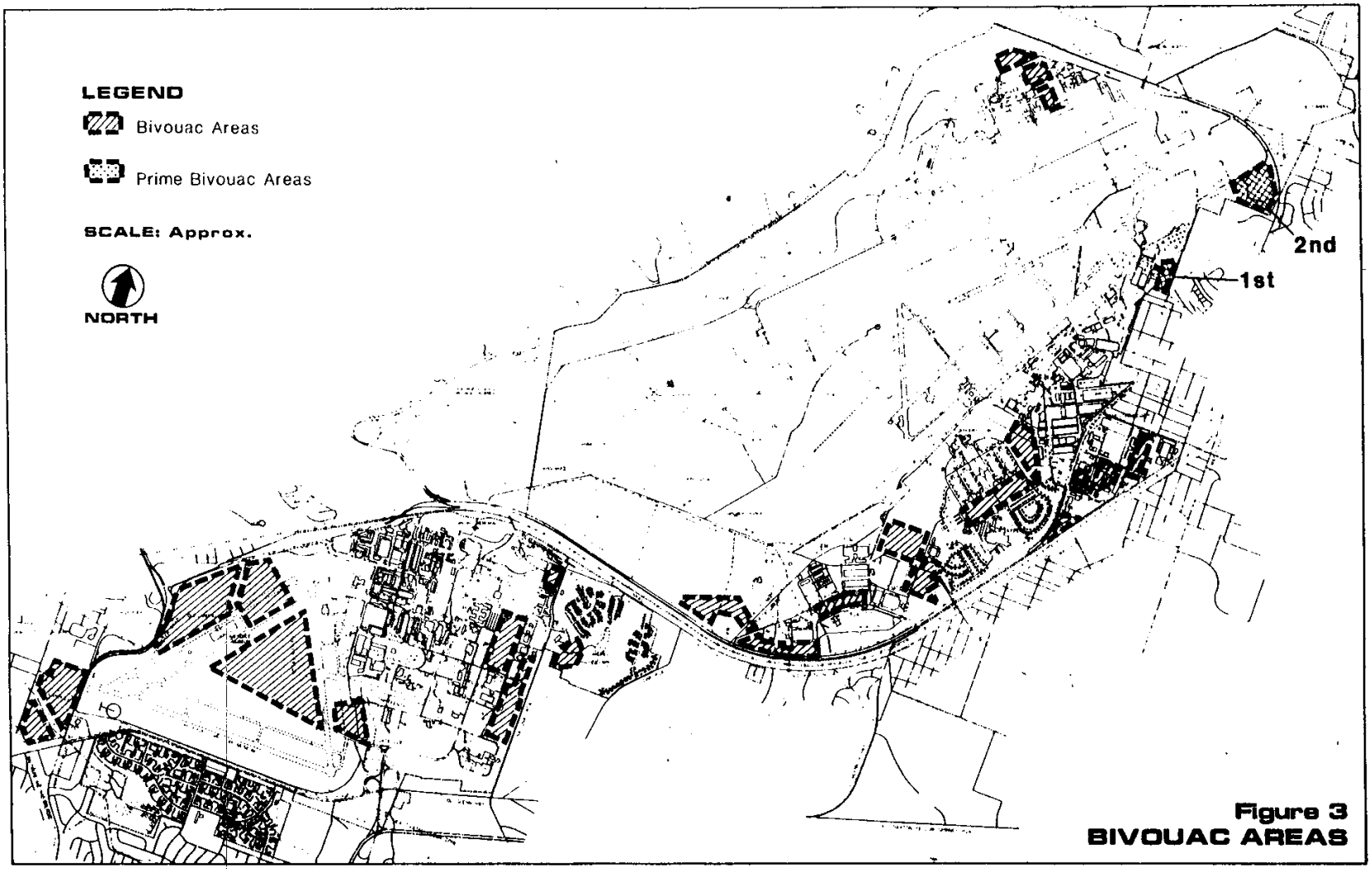

Figure 3
BIVOUAC AREAS

Runway System Is Adequate for the Aerial Port Dock Centers

Interviews with 2750 ABW/OMTX personnel indicate that the current runway system is sufficient to accommodate the air traffic volumes expected during a surge. C -5 and B -747 aircraft are the largest aircraft to use the airfield during a surge. The primary runway has sufficient pavement length and width to accommodate these aircraft.

The major operational limitation of the airfield is the taxiway system, not the runway system. Surge is further limited by aircraft loading time: Two hours and 15 minutes are required to load a C -141.

Two Taxiway Improvements Are Needed for Air Traffic Flow During Surge

Landside facilities and the Aerial Port Work Center are on opposite sides of the primary runway, with the Aerial Port Work Center on the East Ramp. Aircraft taxiing between the East Ramp and the primary runway must pass through a congested parking ramp, cross the secondary runway and traverse a circuitous route. Aircraft taxiing from the East Ramp to Runway 5L have to cross the primary runway and use Taxiway 17 to reach the end of Runway 5L. (Aircraft capable of making a departure from the intersection of Taxiway 12 and Runway 5L/23R do not have to cross the primary runway.) Figure 4 depicts taxiway improvements that should be made as soon as possible to alleviate the inefficient taxiway system.

Aircraft Parking Plans Can Accommodate Aircraft During a Surge

During recent hurricane evacuations, Transient Alert was able to park 408 aircraft, including temporary parking on Runway 5R/23L and some taxiways. During a surge, Runway 5R/23L and Taxiway 17 should not be used for aircraft parking, and Apron H should be reserved for cargo marshalling. However, the following areas listed in the Hurricane Parking Plan appear suitable for aircraft parking during a surge:

°West Ramp: 15 C -1413s, C -130s, P -3s or other large aircraft

°Taxiway 8 between Taxiways 3 and 5: 287 fighter aircraft

° Taxiway 8 between Taxiways 3 and 12: 25 fighter aircraft

° Taxiway Stub 12: 22 fighter aircraft

° Taxiway Stub 8: eight fighter aircraft

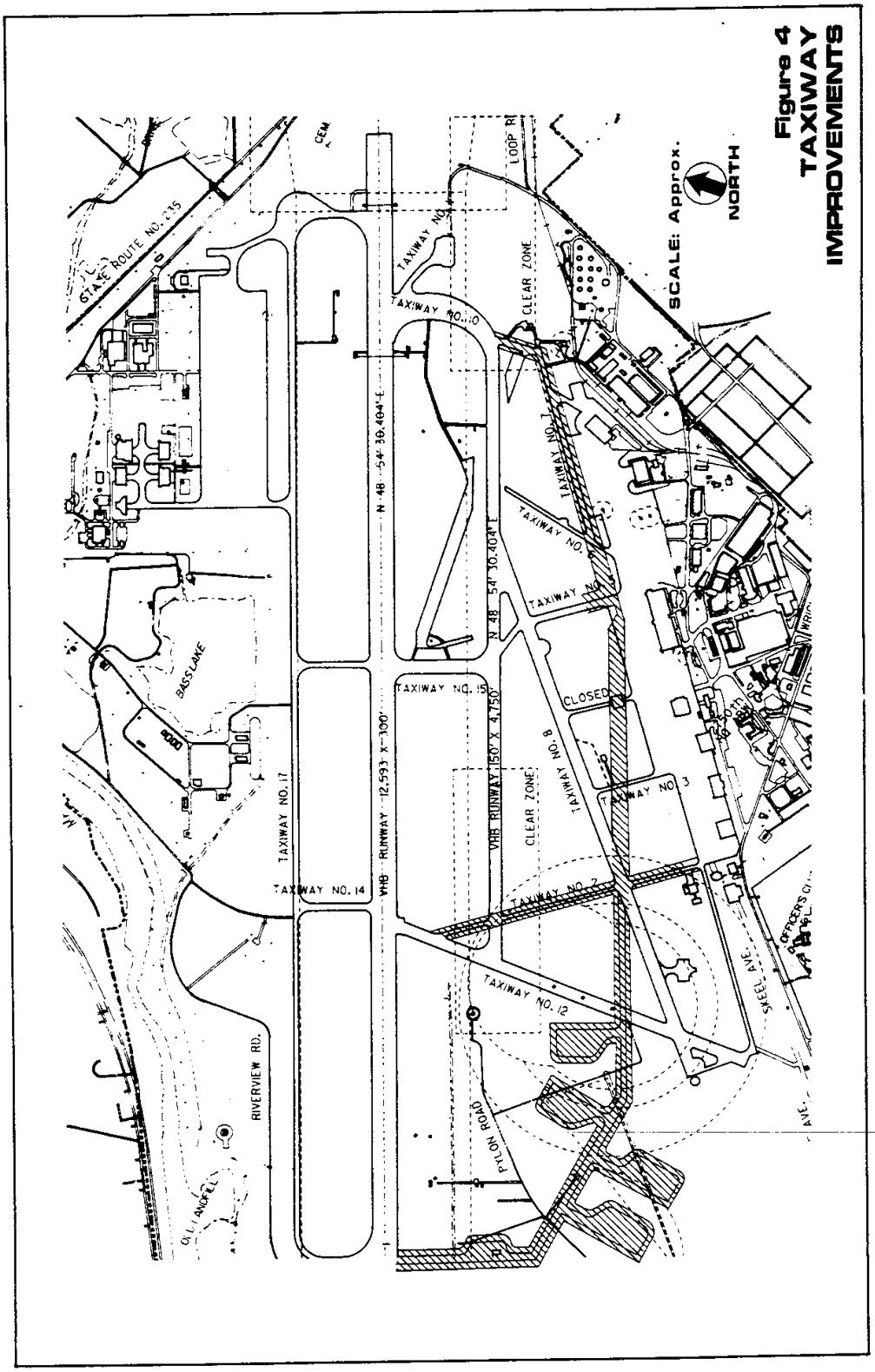
Figure 4
TAXIWAY
IMPROVEMENTS
SCALE: Approx.
NORTH
STATE ROUTE NO. 135
TAXIWAY NO.
TAXIWAY NO. 10
CLEAR ZONE
LOOP RI
TAXIWAY NO. 1
TAXIWAY NO.
TAXIWAY NO.
N 48 54' 30.404"E
BASSLAKE
TAXIWAY NO. 17
TAXIWAY NO. 14
VHB RUNWAY 12,593 X 300'
TAXIWAY NO. 15
VHB RUNWAY 150' X 4,750'
CLEAR ZONE
CLOSED
TAXIWAY NO. 8
TAXIWAY NO. 3
TAXIWAY NO. 2
TAXIWAY NO. 12
PYLON ROAD
RIVERVIEW RD.
SKEELS AVE.
OFFICER'S CI...

The two taxiway stubs (Taxiway Stub 12 and Taxiway Stub 8) are within the Quantity/Distance (~/D) Zones for munitions loading on Taxiway 12 and for the future hot cargo pads. These parking locations should not be used when munitions are in the Taxiway 12 loading area or the new hot cargo pad.

Other parking will be available during a surge because some base organizations that will depart during a surge, such as the 906th Tactical Fighter Group (TFG) and Detachment 2 1401st Military Airlift Squadron (MAS). The cargo terminal parking area can accommodate one C -5 and three C -141s or two C -5s. Only Department of Transportation (DDT) Class B and C and Department of Department of Defense (DOD) Class 1.3 and 1.4 explosives can be loaded at the cargo terminal. DDT Class A and DOD Class 1.2 and 1.3 explosives must be loaded at the hot cargo pad.

Current Base Plans Do Not Include Additional security Personnel to Secure Aircraft During Surge

Current base plans do not adequately nor specifically address the problem of inadequate security forces for securing the increased numbers of aircraft projected to be at the base.

C. Recommendations

A review of the Surge Capability Plan and an analysis of needs and requirements show limitations in munitions storage and loading, the Aerial Fort Work Center, bivouac sites and direct access routes. Recommendations for enhancing these portions of the plan are discussed below and illustrated in Figure 5.

Improve Munitions storage Area and Construct New Hot Cargo Pads

The location of the munitions storage area is excellent with respect to truck access and separation from populated areas or major activity centers of the base. However, the existing facilities have water leaks. Additional flood -proofing a nd other remedial measures are recommended. A new facility to accommodate the off -loading/loading of munitions trucks is also recommended adjacent the new hot cargo pads.

The new hot cargo pads and the taxiway improvement from the East Ramp to Runway 5L should be constructed as soon as possible to relieve the serious limitations on airfield operations caused by munitions loading on Taxiway 17. The new hot cargo pads have ideal truck access from I -675. An additional hardstand and a new facility adjacent the pads to accommodate the off -loading/ loading of munitions trucks are recommended.

This planning effort considered the possible advantages of improving rail access to the new hot cargo pads. However, since no suitable rail sites are available at the base, future plans involving munitions movement at the base should be based on truck movement, not rail.

Enhance Existing Aerial Port Work Center

The Aerial Port Work Center works well except for a few inconveniences. Enhancement would eliminate some of these inconveniences, making the Aerial Port -more efficient.

Use State Route 235 and Gate 26C

State Route 235 and Gate 26C provide excellent access for both munitions and personnel. State Route 235 and Gate 26C also provide quick access to State Route 8, which has access to both I-70 and I-75. After State Route 444A is completed, munitions shipments should use this route for access to the new hot cargo pads.

Avoid Development Near Munitions Areas, the Aerial Port and Routes to Aerial Port

Development should be discouraged where surge activities take place during contingencies. Specifically, development should be avoided near munitions loading and unloading areas, the Aerial Port and direct -access routes from the gate system to the Aerial Port.

Use Some Open Space Areas for Emergency/Temporary Facilities

All open space not in the flood plain nor near fuel or munitions storage should be programmed for future development with the knowledge that the land may be needed for emergency or temporary facilities.

Identify Key Gates to Be Used During a Contingency

The base needs to identify gates to be used during a contingency. The gates should be able to accommodate large traffic volumes.

Construct Improvements to Increase Airfield Operating Efficiency

The base should construct taxiway improvements to Runway 5L from the East Ramp and new hot cargo pads as soon as possible.

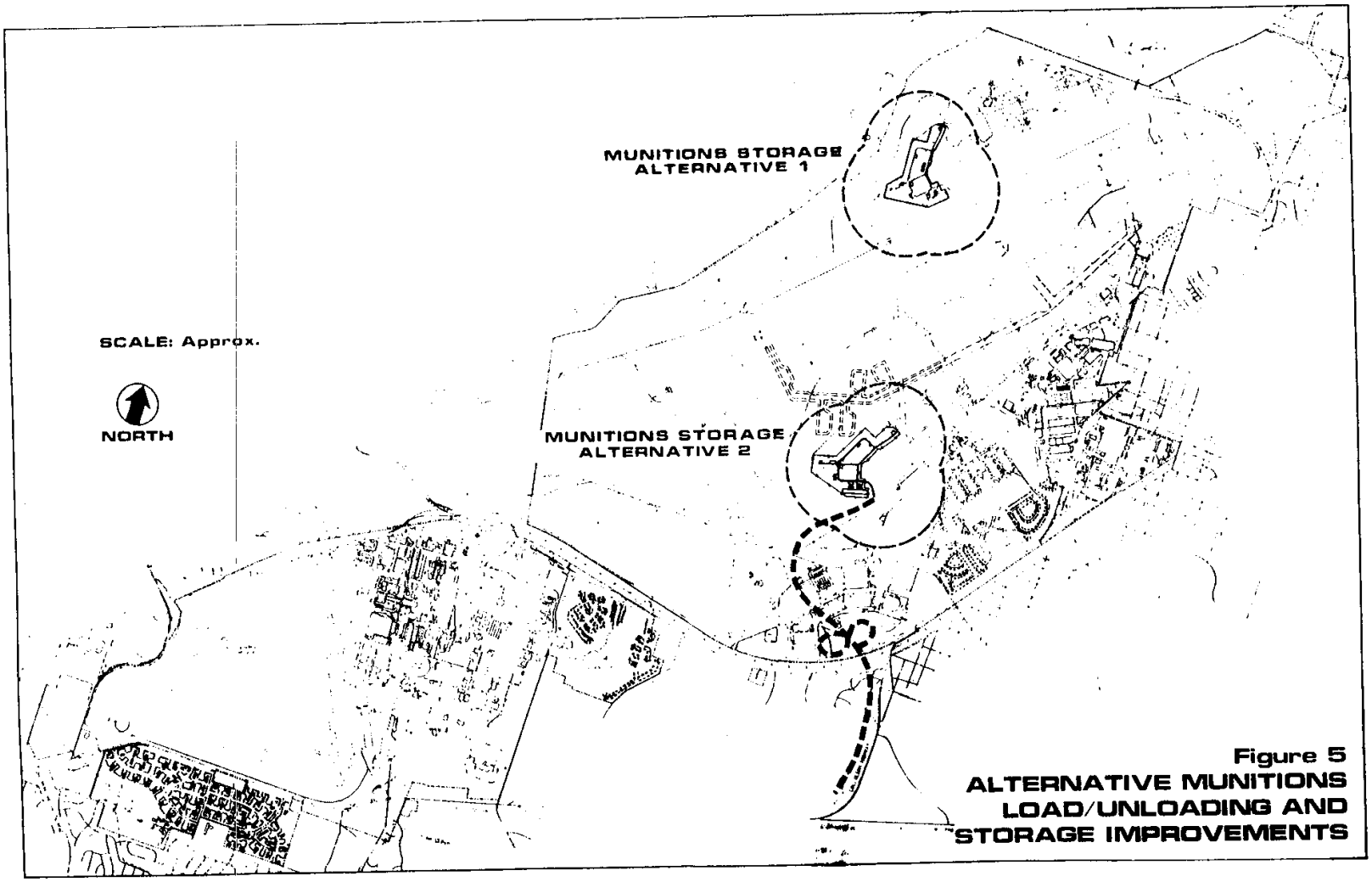

Figure 5
ALTERNATIVE MUNITIONS LOAD/UNLOADING AND STORAGE IMPROVEMENTS

Add Facilities to Enhance Aerial Port Efficiency

Several facility improvements would enhance the capabilities of the Aerial Port Work Center. These include a drive -on scale and a roll -on/roll -off dock; additional warehouse space behind the Air Freight Terminal, Cargo Marshalling Office, Air Passenger Terminal/in -flight kitchen adjacent Ramp H; and repositioning the control tower to the East Ramp.

PHYSICAL SECURITY

III. PHYSICAL SECURITY

Physical security means protecting the physical and data resources of the base. The 2750th ABW Security Police Squadron is responsible for protecting physical resources, which include facilities, equipment, personnel and private property. Individual units are mostly responsible for protecting data resources, which include advanced technology and research and development results. Most research and development at the base is performed by Aeronautical Systems Division (ASD) in Area B and the 4950th Test Wing in the West Ramp area. ASO Security Police are responsible for preventing the transfer of technology and information to unauthorized persons. The ASD Security Police also comply with and implement 2750 ASD direction and guidance. The Air Force Office of Special Investigations (AFOSI) Detachment 540 is responsible for preventing espionage and technology transfer from the base.

A. Overview of Existing Resource Protection Plan

The 2750th ABW OPlan 125 -37, the existing Resource Protection Plan, has two missions:

- Provide preventive measures, deterrent actions, detection methods, reporting and evaluation of hostile or suspicious acts.
- Expand base security with expedience from normal day-to-day operations in the event of theft, pilferage, robbery or a bomb threat.

The existing plan also identifies more than 150 sensitive facilities and areas, shown in Tab 0 -2 and listed in Appendix A. These facilities and areas contain resources that are sensitive, mission-essential or required by regulation.

Plan Provides Safeguards and Identifies Sensitive Facilities

The 2750th ABW OPlan 125 -37 is the basis for developing and ensuring security safeguards for all Air Force physical resources at the base. These resources include drugs, weapons, ammunition, explosives, funds, precious metals and jewels, automobiles, equipment, supplies and other useful or marketable physical resources.

Three Key Assumptions Underline Resource Protection Plan

The Resource Protection Plan assumes that petty thievery can be minimized by applying stringent controls and taking firm punitive measures against violations. The Plan also assumes

that robbery attempts can be deterred if all personnel follow guidelines in the theft prevention program and will use physical security aids. Finally, it assumes that civil disturbances and other criminal acts may occur because of the overall mission of the base, the mission of its operational components and the necessity to store weapons, munitions and high -value property on base.

Resource Protection Plan Outlines Operational Constraints

The Resource Protection Plan outlines four operational constraints that limit security measures at the base.

(1) The Best Plan Cannot Always Deter a Professional Thief

The Resource Protection Plan cannot completely deter a professional thief. However, using dedicated patrols throughout the base and random vehicle inspections at exit points will deter the professional thief.

(2) Base's External Boundaries Provide Easy Access

The external boundaries of the base can be breached. For instance, access can easily be gained to Area C next to the north side of the West Ramp by wading through shallow parts of the Mad River.

Topography Presents Several Security Concerns

The prevailing topography of the base and the immediate vicinity presents potential security problems. The off -base gentle slopes and large wooded area bordering the northern and eastern sides of the West Ramp are ideal for mortars and undetected firing positions. The dense vegetation of the base perimeter offers concealment for trespassers.

(4) Base Lacks Security Police Patrols During Peak Traffic

Interviews with base personnel indicate that security police patrols are inadequate during peak traffic and pedestrian hours when patrol personnel are assigned to gates and turnstiles.

B. Existing Physical Security Programs and Policies

The AFOSI determines the level of threat at each Air Force installation based on intelligence reports and current national and international affairs. The level of threat helps determine

the level of prevention needed. Currently, the level of threat and the level of security project funding are higher overseas than at CONUS installations.

Active-duty Air Force units at the base do not have strategic nor tactical aircraft nor aircraft equipped with nuclear weapons so the base is not a priority mission. Even though the 906 TFG/AFRES has tactical aircraft (F-4) assigned to its unit and will have F-16 aircraft in the future, funding for security projects is appropriated to priority missions before non-priority ones.

Security programs and policies at the base focus on implementing anti-terrorism planning and design guidelines, creating security zones, developing Security Awareness Vulnerability Evaluation (SAVE) teams and increasing security awareness of all base personnel. Each program is described below with a review of programmed security improvements.

Anti-Terrorism Planning and Guidelines Focus on Land Use, Site and Transportation Planning

Air Force anti-terrorism planning is in three categories: land use planning, site planning and transportation planning. Although terrorism is not considered a serious threat at the base, the Headquarters of the Air Force has prepared specific anti-terrorism planning and design guidelines to limit access, prevent major structural damage, and minimize loss and damage to facility contents because of terrorist activities. Different options are available for arranging land uses, siting, orientation and facility design to decrease vulnerability to terrorist attack.

(1) Land Use Planning Should Consider Topography, Vegetation and Structures

The Future Land Use Plan (Component Plan D-l.l) is partly based on an evaluation of on- and off-base constraints and opportunities. These include terrain, vegetation and structures that could conceal terrorists, facilitate access by adversaries or permit outside observation of Air Force activities.

(2) Site Planning Considers Distance from Perimeter, Landscaping, Topography and Population

Location and natural features of the site can be used to limit the opportunity for terrorist activities. Facilities should be sited a minimum of 150 feet inside the base perimeter to reduce the potential for attacks from outside the perimeter.

Facilities should be sited so that topographic features, vegetation and adjacent structures will permit facility occupants and security personnel to monitor the adjacent area. Landscaping should permit occupants to look out without allowing outsiders to monitor activities within.

Facilities should not be sited adjacent higher terrain, other buildings, vegetation or topographic features such as drainage channels, ditches, ridges or culverts since these locations have an increased vulnerability.
Facilities containing mission -critical contents such as explosives should be away from densely populated structures to reduce personnel injury or loss.

(3) Transportation Planning Should Prohibit Direct Access and Fortify the Perimeter

Transportation plans should avoid direct or straight -line vehicle access from base gates. Plans should avoid soft entry points in the base perimeter and in approach areas to high -risk resources. Plans should include alternative ingress and egress routes for fuel and munitions delivery vehicles. Parking areas and driveways should not be planned in or under facilities, and parking areas should not be planned within 150 feet of sensitive facilities.

Base Creates Security Zones Around the Airfield and ASD Complex

The base perimeter fence is not designed to prevent people from entering the base. Rather, the perimeter fence is a means of marking the boundary. Anyone who crosses the fence is liable for prosecution for trespassing on a federal installation. As a counteractive measure, the base has created security zones around sensitive facilities within the base perimeter. To gain access to each zone, a person must show proper identification. The more sensitive the security zone, the more requirements for credentials. This ensures that only persons with proper security clearances are granted access to a particular zone.

Security zones have been or are being created around the airfield and the ASD Complex. A fence is planned for the airfield, with automated entry control devices on the gates leading to the airfield. Several sensitive facilities within the ASD Complex have card reader or cipher (code) locks at their entrances.

Base Implements SAVE and Other Security Education Programs

The base has implemented an education and motivation program and has developed SAVE teams. The importance of educating employees in security practices and policies cannot be underestimated since the number of Security Force personnel is unlikely to increase. Base employees are taught to challenge anyone in a facility without an identification badge. To help educate and motivate employees, SAVE teams have been organized to attempt breaches of security at individual facilities. This exercise keeps employees aware of the possibility of a security breach.

Eight Security Improvements Will Increase Security

Eight programmed projects will increase the base's security level. These projects are described below and depicted in Figure 6.

(1) Hot Cargo Pads Will be Constructed

The first security -related project is the constr uction of hot cargo pads in the interior of the airfield where the pads will be less accessible to attack. This project is programmed for fiscal year (FY) 1993.

(2) Flight Line Will be Fenced

In FY 1990, the base will install 27,440 linear feet of fencing around the flight line to create a security zone or compound around the runways, taxiways and aprons. The new hot cargo pads will be inside the security zone.

(3)Construction of I-675 Connector Could Allow a Reduced Number of Gates

The construction of State Route 444A (known as the I -675 connector) in FY 1987 will reduce traffic volumes at Gate 15A because of high traffic volumes on the connector. This could enhance security by allowing the base to close Gate 15A. Gates 12A, 14A and 16A are already closed.

(4) Automated Gates Will Be Installed at Buildings 262,266 and the Flight Line

A trial automated gate system is planned to be installed at Buildings 262 and 266 in FY 1987 and on the flight line in FY 1989. Security personnel now assigned at these locations will be available for other duties. If successful, the automated gate system will be implemented at other sensitive facilities.

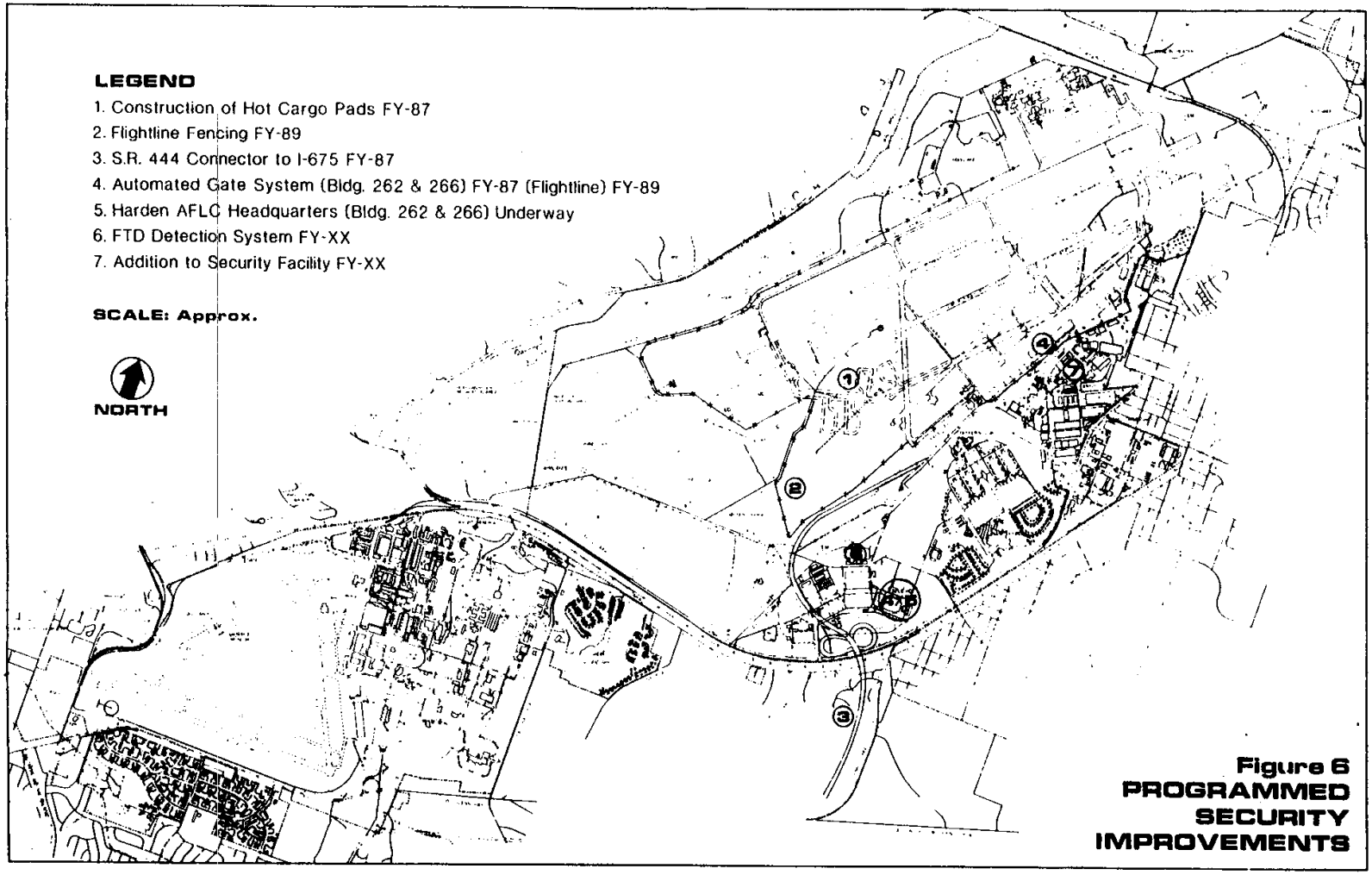

Figure 6
PROGRAMMED SECURITY IMPROVEMENTS

(5) AFLC Headquarters Will Be Hardened to Prevent Terrorist Attacks

A physical security improvement currently under way involves hardening the AFLC Headquarters in Buildings 262 and 266. This project includes extensive landscaping and creating natural and constructed barriers to prevent terrorist attacks. This improvement still provides a driveway immediately adjacent the building and parking within 150 feet of the building. The driveway provides straight-line access from Gate 12A to the building. Barriers will prevent vehicles from the parking lot, but not the driveway, which cannot be protected.

(6) Intrusion Detection System Will be Installed at Foreign Technology Division

An intrusion detection system will be installed at the Foreign Technology Division (FTD) in Building B56 in Area A. Designed to detect human intrusions into protected facilities, the system consists of electronic monitoring devices, detection devices and associated transmission lines, power supplies and signaling equipment.

(7) 275Dth Security Police Headquarters Will Be Expanded

A second out-year security-related project is a 221-square-foot addition to the 2750th Security Police Headquarters in Building 168 in Area C.

(8) ASO Acquisition Management Complex Will Be Designed for Security

The new HQ ASD Acquisition Management Complex (ASD 2000) will contain key command section officials and support activities, consolidating some of ASD's key offices onto] a secured facility. The design and construction of this facility will concentrate on security. This facility is programmed for FY 1990-1992, depending on funding availability.

C. Needs and Requirements

Personnel at three pertinent security organizations were interviewed to assist in determining the requirements to improve security:

- **2750th ABW Security Police**, who are primarily concerned with the physical security of the base;

- ASO Security Police , who ensure data security within the ASD Complex in Area B; and

- H9/AFLC Headquarters Security Police , who are concerned with all aspects of base security and provide an overall perspective throughout the Command. Their primary responsibility is security at the AFLC Headquarters Complex (Buildings 262 and 266) and the Air Force Museum.

Sitings of sensitive buildings were reviewed in accordance with anti -terrorism planning and design guidelines. The results of this analysis are shown in Table 1 and identify the following -situations:

- Facilities within 150 feet of parking areas and driveways;

- Facilities less than 150 feet inside the base perimeter;

- Buildings sited against drainage channels, ridges or culverts; and

- Buildings with functional -critical contents near densely populated areas.

The transportation network was reviewed to identify situations in which direct vehicle access is available from base gates to high-risk resources and to identify alternative ingress and egress routes for fuel and munitions delivery vehicles.

Major security problems at the base are identified below, and the needs and requirements for resolving those problems are discussed.

Fencing Would Resolve Several Key Security Issues

Several key security problems at the base are associated with the lack of fencing. These problems include:

(1) Openings in Perimeter Fence Provide Opportunities for Theft

Openings in the perimeter fence provide ample opportunities for theft, particularly near the Commissary/Base Exchange loading dock in the Kittyhawk Community Center. This area is open with unrestricted access to trucks unloading. This area has been continually emphasized as a problem by the 2750th ABW/SP.

(2) Flight Line Is not Completely Fenced

The flight line fence does not completely surround the flight line. However, the partial fencing and three flight line patrols (one full -time and two during operating hours) diminish the security issue at the flight line.

(3) Two MFH Areas Are Not Fenced

The Page Manor and Woodland Hills Military Family Housing (MFH) areas are not fenced and are essentially wide open. The absence of a fence makes these areas easily accessible to criminals. Civilian police forces patrol these areas even though the areas are outside their jurisdictions, providing double coverage. However, the 2750th ABW/SP provides most of the coverage and response to these areas.

Additional Personnel Are Necessary to Improve Security Levels

The 2750th Security Police have the security responsibilities and concerns of a medium -sized city with one notable exception: Security Police provide protection for many aircraft, including ASD's one -of-a-kind aircraft and valuable transient aircraft.

Even though the 2750th Security Police are authorized 249 personnel (142 military, 87 civilian and 20 part -time and temporary gate guards), only 243 personnel are assigned to the unit (140 military, 85 civilian and 18 part -time and temporary gate guards).

ASD Security Police provide guidance and direction for protecting information and conduct industrial security inspections at the ASD Complex in Area B and at the 4950th Test Wing on the West Ramp; however, they do not provide physical security for the West Ramp or Area B. The 2750th ABW/SP is responsible for the physical security in those areas. The ASD Security Police are authorized 32 security specialists (1D military and 22 civilian), but they are assigned only 26 who investigate reported security lapses as well as educate ASD employees on the importance of security. The following issues support the need for additional personnel to increase security levels:

(1) Security Police Lack Personnel and Equipment to Patrol Base

The 2750th Security Police lack the personnel and vehicles to service the entire base during peak hours. Emphasis on providing personnel and vehicles to patrol the base perimeter and sensitive on -base facilities should increase.

(2) Transient Aircraft Are Not Provided Security Priority

Transient aircraft are not given the same security priority (or dedicated security) as operational priority aircraft, which are assigned to a base and parked in designated restricted areas with signs, ropes and dedicated patrols.

(3)The 2750th ABW Special Police Are Not Always Notified of Operational Priority Aircraft On Base

The 2750th ABW Security Police are frequently not notified when operational priority aircraft are present. Security should be provided these aircraft because the Air Force could suffer significant financial and operational loss if these aircraft were stolen, damaged or destroyed.

(4) 4950th Test Wing Receives Little Securi

The 4950th Test Wing parks many one -of-a-kind aircraft outdoors or inside hangars and maintenance facilities on the West Ramp. Only one security patrol officer is assigned to the West Ramp at night, and facilities on the West Ramp have no entry control devices. Even though its planes are custom made for tests and are irreplaceable, the 4950th lacks security because of its nonpriority status.

Parking Lots Should Be 150 Feet from Sensitive Facilities

New sensitive facilities should not be sited within 150 feet of an existing parking lot, nor should they be constructed with parking underneath. Existing parking lots near sensitive facilities should be reconfigured, if necessary.

Perimeter of Area B Is Vulnerable Because of Easy Access and Heavy Vegetation

Heavy vegetation around the Area B western perimeter and the relative ease of entry into Area 3 during peak traffic hours are also security concerns. The dense vegetation makes the perimeter vulnerable to penetration. Heavy traffic flowing into Area B from I -675 (three lanes) and Springfield Street (two lanes) makes inspecting each vehicle for proper identification difficult.

The availability of vehicles with valid identification stickers in local used -car lots compounds the problem of inspection. This problem is present at all gates on all bases.

Hospital Visitors Coming in Gate 9A Have Access to Areas A and C

A person who enters through Gate 9A to go to the hospital gains access to all of Areas A and C.

Automated Entry Control Devices Are Necessary at Sensitive Facilities Area

Security problems in Area B are aggravated by the large number of employees with access to this -area, visitors to the Air Force Museum, foreign students at the Air Force Institute of Technology (AFIT) and foreign sales representatives. Thus, automated entry control devices at the entrances of sensitive facilities and at doorways leading to even more sensitive offices or research laboratories are vital to Area B security.

(1) The Large Number of Employees Creates Security Concerns

Controlling the movement of the 11,500 workers employed at the ASD Complex is cost -prohibitive: However, this problem is partially solved by using automated entry control devices.

(2) ASO Complex Is Subject to Entry by Visitors to the Air Force Museum Annex

The proximity of the Air Force Museum to ASO and the presence of the Air Force Museum Annex within ASO present security concerns. The Air Force Museum attracts many tourists. Once inside the Air Force Museum Annex, tourists could accidentally wander into sensitive areas.

Although wayward tourists have not created any significant problems, non -tourists could use the Museum Annex to gain access into the ASO Complex. This potential problem must be controlled by security measures even though the Museum Annex will be relocated adjacent the Museum in 20 years.

(3) Foreign Students and Sales Representatives Have Access to Sensitive Facilities

Many foreign students enrolled at AFIT, some from Eastern European countries, have controlled access into the ASD Complex adjacent AFIT. In addition, many foreign sales representatives have controlled access to Area B. Major problems can be avoided with automated entry control devices at sensitive facilities.

Transportation Improvements and Reduced Entry Points Are Necessary

Transportation planning and gate operation procedures are critical elements for achieving a secure base. The following issues support the need for improving the transportation system and gate operation procedures.

(1) Total Identification Checks Are Difficult to Attain

Checking identification for each vehicle entering the base is difficult. If a THREATCON condition (a level of terrorist threat) forced a 100 -percent identification check, vehicles would be backed up onto State Route 444 and other primary roadways.

(2) Soft Entry Points Provide Quick Access to High -Risk Resources

Soft entry points are long, straight approaches that permit a vehicle to reach a high speed, crash through the gate and gain access to high -risk resources. Gates 12A, 1B, 198 and 39C offer opportunities for vehicles to crash through, then gain access to sensitive facilities.

Public Address System Is Required for Emergency Notification

The base lacks a base -wide public address system to notify people of emergencies. The Security Police must go door to door to notify base residents and employees of impending emergencies, such as tornadoes and bomb threats.

The Base's Threat Level Could Be Changed During Hostilities

Although AFOSI has assigned the base a low threat level, the threat level could be raised during hostilities associated with surge activities. Sabotage teams from the Southern hemisphere could penetrate the southern border of the United States and conduct terrorist operations against military installations. Resupply of military forces would be crucial to the military's ability to maintain combat operations, so the terrorists might target the base, as one of the hubs of Air Force logistical operations.

Increased Funding for Security Is Necessary

If the base had a priority mission or if the perceived threat level were higher, funding for security projects at the base would be larger. However, without adequate funding. these deficiencies cannot be properly addressed:

° The West Ramp contains many one -of-a-kind aircraft that require greater protection.

°The POL storage area is within 200 feet of the base perimeter.

°Sensitive research and development work are performed in Area B laboratories and offices.

D. Recommendations

Recommendations for improving physical security at the base are depicted in Figure 7 and described below.

POL Storage Facility Should Remain As Is

The POL storage facility, a recognized vulnerability at the base, is within 200 feet of the base perimeter and adjacent Loop Road. Three alternatives for dealing with this security risks are to harden the facility, bury it, or do nothing.

AFOSI considers the risk of attack to be low; therefore, the expense of hardening or burying the POL facility is unwarranted. The recommendation is to leave the POL facility at its present site -- an excellent location near the airfield.

Give Sensitive Facilities Individual Attention

The base has more than 150 sensitive facilities or controlled areas. As Table 1 indicated several of these facilities are within 150 feet of the base perimeter, parking areas or other facilities, These locations offer opportunities for terrorism.

The preferred alternative is to examine each sensitive facility individually, then decide whether to leave the facility as it is, relocate it, reconfigure the parking areas around it or relocate the functions within it. Individual attention will assure each facility the best alternative.

Building 12 in Area B and Buildings 70, 210 and 1250 and the POL storage facility in Area C are near the base perimeter. Although these facilities are vulnerable, the threat level is not great enough to warrant funding to relocate them.

Twenty -two sensitive or controlled facilities have parking areas within 150 feet of them. These are Building 830 in Area A; Buildings 12, 15, 22, 45, 65, 146, 434, 441, 620, 622, 640, 652, 653 and 676 in Area B; and Buildings 30, 54, 168, 169, 210, 256

TABLE 1
Wright-Patterson Air Force Base
Sensitive or Controlled Facilities Within 150 Feet of Other Facilities

Area #	Facility #	Adjacent Facility
A	262	266*
	280	281
	828	829*, 856*
B	4B	4A, 4C*, 4D*, 4E*
	11A	12*
	14	15*
	16	11A*, 46*
	23	**18**
	28	**248***
	65	**60, 445, 447**
	71B	**20A***
	145	146*
	652	653*
C	54	30*
	70	71*, 114*, 174*
	120	95
	168	169*, 210*
	258	257*

* Indicates another sensitive facility within 150 feet.

Source: Woolpert Consultants

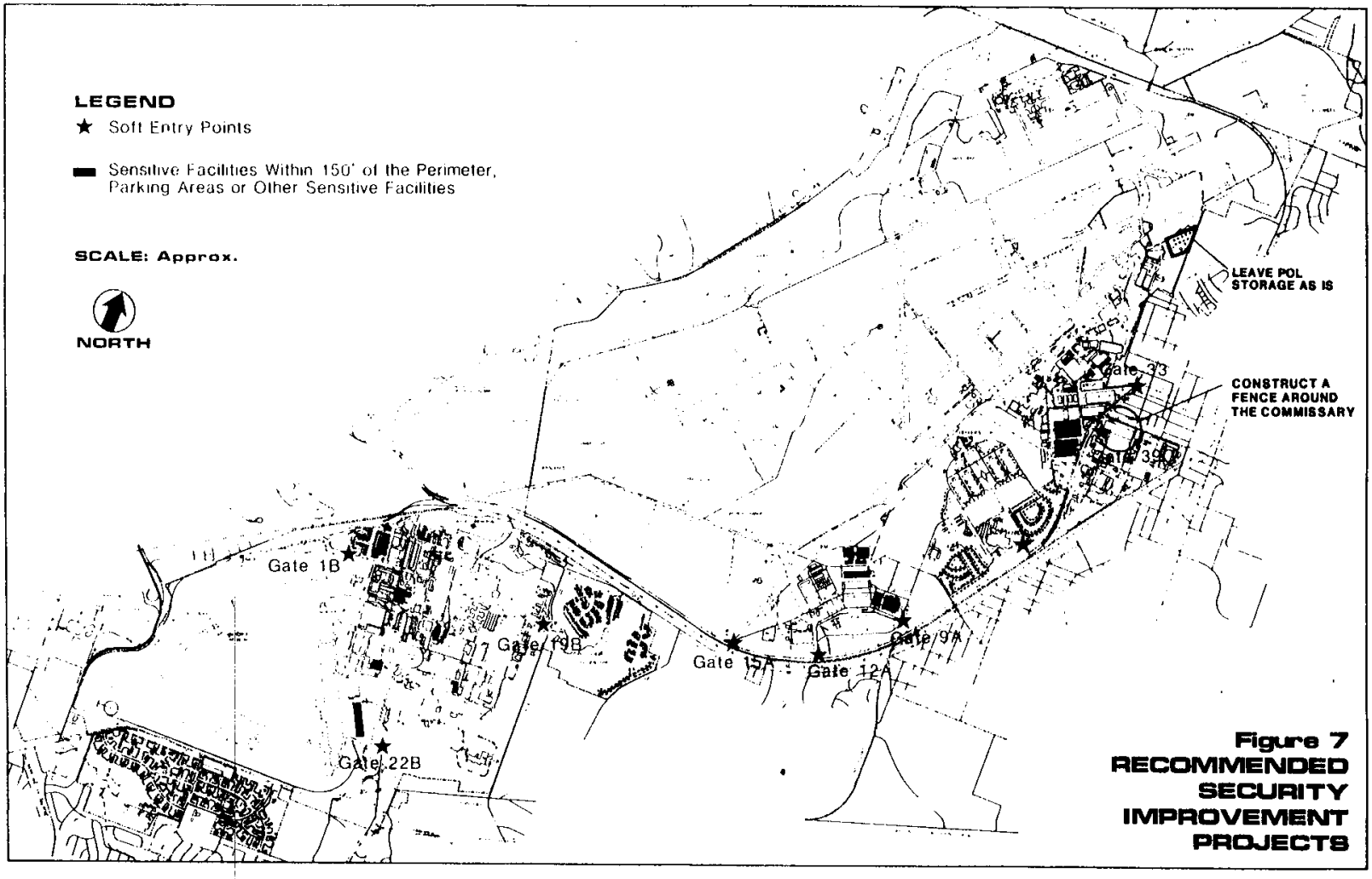

Figure 7
RECOMMENDED SECURITY IMPROVEMENT PROJECTS

and 1250 in Area C. The Transportation Plan will address relocating or reconfiguring parking areas, and the results of that analysis will be included in this component plan.

Eighteen sensitive or controlled facilities are within 150 feet of other facilities, some of them, sensitive or controlled facilities.

Correct Soft Entry Points

Vehicles could crash through Gates 12A, 1B, 19B and 39C and gain direct access to sensitive facilities. This opportunity is partially mitigated at Gate 39C because the approach is short, but the Commissary behind Gate 39C is an attractive target. Security problems at Gate 12A will soon be remedied. Completing State Route 444A will further increase the security of this gate. Gates 1B and 19B could be made more secure by shortening their approaches or creating curved approaches. Shortening the approaches would cause a traffic back up and congestion on the local off -base roads, however. The preferred alternative would be to create a curved access.

Leaving gates as they are would probably be adequate since the level of threat at the base is low. Gate 39C does not have a long approach, but vehicles could achieve a high rate of speed by State Route 444 and crash through the gate. Either the curved approach or the do -nothing alternative would be acceptable, depending on the level of threat and the acceptable risk.

Gates 9A, 12A, 15A, 1B, 19B, 22B and 33C are key entry points with long, straight approaches that would allow vehicles to gain enough speed to crash the gates easily. Gates 12A and 15A could be closed and replaced with a new gate after the completion of State Route 444A.

Construct Fences Around Base Commissary

The airfield and the area behind the Base Commissary need additional fencing. A fence is planned around the airfield, but not around the Commissary.

Improve Routes for Munitions and Fuel

Existing munitions and fuel routes are adequate. Trucks carrying munitions shipments enter the base by Gate 26C and reach the munitions storage area by Douglas Road and Mitchell Drive. Fuel trucks also enter Gate 26C and reach the POL facility by Loop Road.

As an alternative route for munitions shipments, trucks could enter the base by Gate 57C and reach the munitions storage area by Riverview Road. Fuel trucks could enter Gate 33C and reach the POL by Skeel Drive.

The proposed State Route 444A will offer another alternative for both fuel and munitions shipments. However, these roads will go through high population areas.

DISASTER PREPAREDNESS

IV. DISASTER PREPAREDNESS

Disaster preparedness planning is designed to protect lives and property in a disaster while maintaining the 2750th's mission capabilities. Disaster preparedness covers natural disasters such as fires, severe weather and floods; major peacetime accidents; nuclear attacks and conventional attacks. The Base Plans/Disaster Preparedness Division of the 2750th ABW is primarily responsible for disaster preparedness at the base.

A. Overview of Existing Disaster Preparedness -Plan

The base's Disaster Preparedness Operations Plan 355 -1 (OPlan 355-1) outlines actions to be taken during disasters. The existing plan recognizes that the base is vulnerable to attack, covert enemy acts such as sabotage and espionage, natural disasters and major accidents. The five key assumptions of the existing plan are discussed below.

Plan Assumes an Attack May Come with or without Build-Up

The first assumption is that an initial attack can come with minimum warning (tactical) or be preceded by a detectable enemy . build -up (strategic). The attack may be nuclear, which will cause widespread contamination and limit the operational capability of the 2750th ABW.

Plan Assumes the Base Will Respond to Accidents

The second assumption is that major nuclear or non-nuclear accidents could occur at the base and require response.

Plan Assumes Hazardous Weather Can Strike the Base at Any Time

The third assumption is that severe weather could strike the base without warning. Lightning, hail, tornadoes, strong wind gusts, thunderstorms, blizzards and freezing precipitation are all possibilities.

Plan Assumes Base Will Receive Assistance

The fourth assumption is that assistance will be furnished in accordance with local agreements and memoranda of understanding.

Plan Assumes Base Will Assist Neighboring Communities

The final assumption is that initial disaster relief assistance to local communities could be required at any time.

B. Existing Disaster Response Procedures

The base population will be notified of an impending disaster by one of two base siren signals. The attack warning signal is a three -to -five -minute wavering tone, indicating an actual attack has been directed against the United States and warning everyone to take shelter immediately. The alert signal is a three -to -five -minute steady tone, indicating an emergency other than a hostile attack is imminent. Local media and security police personnel will inform base personnel about the type of emergency and the action to take.

The base is concerned about three types of disasters: nuclear attack, natural disaster and accidents. Measures to prepare for each are described below.

Base's Operation Shelters Can Protect Personnel and Mission-Critical Functions During a Nuclear Attack

The base could be subject to an enemy attack with nuclear weapons with little or no warning. In a direct nuclear attack, very little, if anything, at the base will survive. Shelters are not stressed to withstand blast effects nor the pressures associated with nuclear detonation.

Advance planning, however, can minimize the capability of a nuclear attack to destroy the base's capability to perform its mission. This planning provides survival protection shelters for personnel, evacuation of dependents and civilians and plans to restore full operational status in the shortest time possible following an attack.

The base has one protective shelter (Building 262) and 15 emergency operations shelters. The protective shelter, Building 262 (Area A), is for military personnel and emergency -essential civilians. Emergency operations are operated by a trained shelter management team, and they house mission -critical functions that must be furnished with personnel on a 24-hour -a-day basis during emergency situations. Dependents and remaining civilian employees will be sheltered by local governments or relocated away from the base. This relocation could cause a massive gridlock at the base.

Base Strives to Minimize Property Damage and Personnel Injuries During Natural Disasters

Natural disasters are emergencies resulting from floods, earthquakes, snowstorms, tornadoes, severe thunderstorms or similar catastrophes. The base s mission during natural

disasters is to minimize property damage and personnel injuries through prompt weather warnings, necessary protective actions for facilities and aircraft, prompt treatment of injuries and the quick recovery of mission capability.

The base will also assist local communities when civilian recovery resources are exhausted or inadequate to cope with the disaster.

Three types of natural disasters are important: a) tornadoes and high winds, b) flooding and c) blizzards and heavy snows. Earthquakes are not a major concern in Ohio.

(a) Tornadoe

Base Operates Eight Shelters for Protection Against Tornadoes or High Winds

Tornadoes and high winds are the most prevalent of the natural disasters, the most likely to strike the base and the most destructive. Heavy thunderstorms and hail may accompany tornadoes and high winds, and these conditions may warrant special protective measures.

The base has eight clearly marked tornado shelters in Buildings 11, 207 and 256 in Area C; Buildings 14, 15, 18 and 450 in Area B; and Building 262 in Area A. These shelters are designated in Figure 8. Although not official tornado shelters, each facility has areas that provide protection from tornadoes or high winds.

(b)

Equipment in Areas A and C and the Kittyhawk Center Are Evacuated During Floods

Large portions of Areas A and C are within the flood plain of the Mad River. If these areas are flooded, equipment will be evacuated, according to Detachment 15, 15th Weather Squadron and the Miami Valley Conservancy District.

(c) Blizzards and Heavy Snows

Base Responds to Blizzards and Heavy Snow by a Snow Removal and Frozen Water Pipe Prevention Program

The combination of extreme cold wind and heavy snowfall requires special precautions. During heavy snows or blizzards, the base is responsible for snow removal,

preventing frozen water pipes and removing hazardous conditions such as large icicle formations and snow accumulations over doorways.

Aircraft Accidents Are More Common than Nuclear or Hazardous Materials Accidents

The base is responsible for accidents involving aircraft or nuclear or hazardous materials and for off -base military accidents. Aircraft accidents are the most likely to occur at the base.

Aircraft accidents may involve conventional weapons, nuclear weapons and hydrazine fuel. They may involve aircraft or other vehicles. When conventional munitions are involved, extreme caution must be exercised when approaching aircraft because munitions such as rockets or missiles may be operational.

Toxic substances, such as hydrazine, are also dangerous. Hydrazine, a clear, oily liquid with an odor similar to ammonia, is caustic to the skin and can be fatal if ingested or inhaled. Used in emergency power units in F -16A and B -model aircraft, hydrazine is sensitive to sparks or flame; thus, personnel must consider hydrazine leakage during rescue operations.

In aircraft accidents, the area around the accident site is cordoned off to control access. Only crash -fire -rescue equipment and authorized personnel are allowed near the site.

C. Needs and Require

Three areas of concern should be considered when evaluating disaster preparedness at the base: education, evacuation and shelters. Needs and requirements for these are addressed below.

Existing Programs Educate Base Personnel and Residents in Disaster Preparedness

Base personnel and residents should understand disaster preparedness, know the location of fallout and tornado shelters, know the proper actions to take during different types of emergencies and know how to evacuate buildings. Educating personnel about emergency measures is important because many people do not realize the seriousness of a disaster until it occurs.

Evacuation Plans Require Clearing Densely Populated Areas Quickly

In theory, this program is efficient; In practice, people may have difficulty getting off base. The plan requires personnel and dependents to know and follow each facility's evacuation plan. And it depends on adequate traffic circulation on base and off for people evacuating the base and for mission -essential personnel returning to the base.

Sheltering Mission-Essential Personnel and Evacuating All Others Provides Required Protection

Existing programs satisfy base shelter needs. Mission -essential personnel are sheltered in Building 262 in Area A. All other personnel and dependents are evacuated away from the base to Shelby County, about 75 miles north of the base. This combination provides effective and efficient protection for base personnel and families if there is time to evacuate.

D. Recommendations

Continue to Educate Base Personnel and Residents in Disaster Preparedness

The base should continue its ongoing education program, annual briefings and orientation of new personnel and residents. These programs work well, so no improvements are necessary at this time.

Reevaluate and Improve Evacuation Plans

Personnel will have difficulty evacuating the more densely populated areas of the base, particularly Area B. The base should test and evaluate the evacuation plans and make improvements as necessary. More education may be necessary if personnel do not know evacuation procedures for every facility; improved circulation plans may be needed if gridlock occurs in densely populated areas of the base; and provisional shelters may be necessary for personnel and dependents who are unable to leave the base in time.

Consider Provisional Shelters

Depending on the base's success in improving evacuation procedures, provisional shelters may be needed for personnel and dependents unable to leave the base.

APPENDIX A

CONTROLLED AREAS AND SENSITIVE RESOURCES

AREA A:	Building 262	Building 266
	Building 800	Building 828
	Building 829	Building 830
	Building 856	Building 867
	Building 892	Building 1455
AREA B:	Hangar 4B	Hangar 4C
	Hangar 4D	Hangar 4E
	Building 11A	Building 12
	Building 14	Building 15
	Building 16	Building 20A
	Building 22	Building 23
	Building 24C	Buildin g 2B
	Building 33	Building 45
	Building 46	Building 50
	Building 50A	Building 65
	Building 71B	Building 100
	Building 145	Building 146
	Building 167	Building 191
	Bui1ding 248	Building 254
	Building 434	Building 441
	Building 478	Building 485
	Building 620	Building 622
	Building 640	Building 641
	Building 652	Building 653
	Building 676	
AREA C:	Building 1	Building 49A
	Building 54	Building 70
	Building 71	Building T -92
	Building 110	Building 114
	Building 120	Building 147
	Building 154 Complex	Building 168
	Building 169	Building 174
	Building 206	Building 210
	Bui1ding 253	Building 256
	Building 257	Building 258
	Building 259	Building 882
	Building 963	Building 964
	Building 969	8uilding 972
	Building 1226	Bui1ding 1250
	Building 4010	Building 4014
	Building 4041	Building 4048 Complex
	Building 4053	Building 4058 Complex
	Pad 3939	Pad 3942
	Aircraft Parking Area	

APPENDIX A
(Continued)

KITTYHAWK: Building 1250

WEST RAMP:	Aircraft Parking Area	Building 4020
	Building 4022	Bui1ding 4024
	Bui1ding 4026	Bui1ding 4028
	Taxiway 18	Taxiway 20

EAST RAMP:	Aircraft Parking Area	Building 100
	Building 145	Building 148
	Building 152	Building 206

OFF-BASE: Building 841

ATTACHMENT 3: Model Statement of Work For a Contracted Contingency Plan Component

The Contingency Plan Component of the Base Comprehensive Plan (BCP) should contain a complete description of the current and expected future conditions on the base. The plan should include graphics suitable to this purpose (see AFR 86 -4 for base tab (map) requirements).

The Contingency Plan will vary according to the needs, conditions and location of each Air Force base, but it should contain, at a minimum:

1. Executive Summary;

2. Description of Existing Conditions;

3. Identification of Problems, Constraints, and Opportunities;

4. An Evaluation of Alternatives;

5. Recommended Plan(s);

6. Plan Implementation Strategies; and

7. Sufficient graphics to enable clear understanding of the findings, process, and results.

These sections of the Contingency Plan should take the reader through an orderly, sequential process of understanding the context of the plan, the approaches and assumptions used, what was found to exist, alternative plan elements, and final plan(s) and implementation measures. See the

Contingency Planning Handbook for major elements to be included in the component.

1. Executive Summary

The Executive Summary should briefly describe the purpose of the Contingency Plan Component, its relationship and affect on the other plan components especially land use, transportation, utilities and facilities development), a summery of base needs, and highlights of the plan recommendations. A person reading only the Executive Summary should be able to understand the primary e1ements of the plan.

2. Existing Conditions

Existing conditions at the base and surroundings, its location and description from a contingency planning standpoint. Existing Conditions maps should be prepared to indicate important aspects of the base affecting its capability to respond to contingency situations.

3. Problems, Constraints, and Opportunities

Describe the current problems, constraints and opportunities identified during the existing conditions inventory. Include a detailed description of what the problems are and the probable causes. Describe any physical, environmental, legal, and other factors on planning and development. Also, identify existing facilities, systems or conditions that provide opportunities for improved contingency response. Include off-base problems and opport~m1;ties to the extent that they will affect planning on the base.

Prepare a map showing locations of problems and opportunities along with a short narrative of each that is number -keyed to the map. Where feasible, forecast potential future problems resulting from c1~anges in mission or threat. Indicate future aspects on the same map 'using a special symbol, color, or by means of an overlay.

4. Evaluation of A1ternatives

For each current and future problem/opportunity, describe the alternatives that were considered. Use a tabular format to display alternatives. Prepare sketches of alternatives, particularly changes that are otherwise difficult to visualize. These might include physical alterations such as road realignments, demolition, and construction alternatives.

Evaluate the alternatives and describe how this evaluation was done and the results for eacl1 problem or opportunity identified. Include a list of criteria and standards used for evaluation purposes. Provide tables showing the comparison of alternatives. Conclude with a ranking of all alternatives.

5. Recommended Plan

Describe the configurations that are needed to meet current and future base contingency requirements. Prepare maps for each major category (e.g., surge capability, physical security, etc.) showing the future plan with short - and long-term recommendations. Use appropriate colors or symbols to differentiate between the recommendations. Include a table describing the recommendations, keying to each map.

6. Plan Implementation

Describe steps to be taken to implement the recommended projects. Include coordination needed among base personnel and off-base agencies. Develop specific policies, programs and projects that will implement the recommendations in the plan.

Prepare a table showing estimated total cost and project phasing to implement the short - and long -term recommendations. The table should include projects in each fiscal year and according to funding source (e.g., Military Construction Program, Operations and Maintenance, etc.).

7. Plan Graphics

Preparation requirements, scales and computerization of the tabs (Tab O of the BCP) are described in the BCP Master Statement of Work, available from HQ USAF/LEEV, or the major commands. In general, the Tabs use the C-1 Tab of the BCP as the basis for mapping contingency requirements. The Contingency Component Tabs are as follow:

Tab 0-1, Surge Capability

Tab 0-2, Physica l Security and Antiterrorism

Tab 0-3, Disaster Preparedness

Tab 0-4, Installation Operability

Tab 0-5, Beddown and Support of Deployed Forces

Tab 0-S, Theater -specific Requirements

Tab 0-7, Camouflage, Concealment and Deception

Attachment 4: BIBLIOGRAPHY

AESC-AD/YQ. 1986. SALTY DEMO: Air Base Survivability Demonstration Final Report .

AESC-AD/YQ. 1987. SCPS Siting Guide .

BDM Corporation. 1986. Alternative Launch and Recovery Surface Design Guidance .

Black and Veatch. 1986. Securing US Army Site Access Points.

Coltharp, David R., Capt., USAF. 1987. Designing Buildings Against Terrorist." The Military Engineer , August, p. 427.

Department of Defense. 1987. Soviet Military Power .

Department of Energy, Office of Project and Facilities Management, 1985. Site Development Planning for Energy Management .

EDAW. N.d. Ultimate Development Plan, Naples Support Activity, Naples, Italy.

Ellis, George E., MG, USAF. 1987. "In Search of Better Eagle's Nest." Air Force Journal of Logistics , Summer Edition, pg. 7.

Federal Emergency Management Agency, Emergency Management Institute. 1987. Exemplary Practices in Emergency Management: The California Firescope Program .

Federal Emergency Management Agency, Emergency Management Institute. 1987. Exemplary Practices in Emergency Management: Business and Industry Council for Emergency Planning and Preparedness .

HQ, Department of the Army. N.d. AR 210 -23, Master Planning for Army Installations, Emergency Expansion Capability.

Herskowitz, Allen P. 1987. "Terrorism in the United States: We Can Defend Against It"' The Military Engineer , March/April, p.

Holmes and Narver, Inc. N.d. "Security Systems Engineering Review of Various Ramstein Air Base Facility Upgrade Projects" (For Official Use Only).

HQ AFESC, Energy Group. 1984. Air Force Energy Vulnerability Assessment Guide.

HQ AFESC, Readiness Directorate, 1983. Bare Base Conceptual Planning Guide.

HQ, Department of the Army. 1983. TM 5-853-1, Designing For Security .

HQ, Department of the Army. N.d. TB Eng 354, Installation Expansion Capability Guide.

HQ USAF/LEE. 1986. "Engineering Technical Letter 86 -10: Antiterrorism Planning and Design Guidance."

HQ USAF/LEE. N.d. Commander's Facility Improvement Guide .

HQ USAF/LEEVX. 1984. AICUZ Handbook .

Hathaway, Stephen A. and Vitucci, Paul C., Capt., USAF 1983. Energy Security." Engineering Quarterly , Fall Edition, p. 4.

HQ USAF/LEYSF. 1985. Air Force Energy Plan.

JHK and Associates for HQ t~AF/LEJ7RX. 1984. Transportation Planning Bulletin .

McCoy, Tidal W. 1987. "Task One: Air Base Operability." Armed Forces Journal International, p. 52.

McDaniel, William T., Tr., Lt. Col., USAF. l°87. "Combat Support Doctrine: Coming Down to Earth." Air Force Journal of Logistics, :Spring Edition, p. 13.

Muir and Associates, AIA. l978. Expansion Capability Plan for Fort Hunter Liggett.

National Research Board. 198S. Protection of Federal Office Buildings Against Terrorism .

National Research Council. 1986. The Embassy of The Future.

Naval Civil Engineering Laboratory. 1982. Guidelines for Designing Facilities to Reduce Losses and Damage Caused by Criminal Acts .

Naval Civil Engineering Laboratory. 1981. Recommended Revisions to Navy Facility Planning Procedures to Incorporate Physical Security Engineering.

Naval Civi1 Engineering Laboratory. 1986. Terrorist Vehicle Bomb Survivability Manual (Vehicle Barriers).

Reinertson, Kenneth L. l986. "Planning for Warfare Capability: The Osan Air Base Experience." Engineering and Services Quarterly , Summer Edition, p. 14.

RGH for HQ USAF/LEEVX. 1986. Land Use Planning Bulletin .

Smith, Edward M., Colonel, USAF. 1987. "Civil Engineering Combat Support: Are We Ready? What Have We Learned?" Air Force Journal of Logistics , Spring Edition, p. 9.

Tarics, Alexander G., PhD. 1987. "Earthquake! Are We Ready?" The Military Engineer, September/October, p. 486.

USAF Tactical Air Warfare Center. 1988. Dusty Demo: Camouflage, Concealment, and Deception Demonstration, Final Report.

US Army, Office of the Chief of Engineers. 1984. Design Guide for US Army Reserve Facilities .

US Army, Corps of Engineers, Omaha District. 1987. Security Engineering Manual (For Official Use Only).

Wegener, Ulrich K., Brig Gen. 1987. "Defeating Terrorism." The Military Engineer , March/April, p. 96.

Woolpert Consultants. 1987. Wright-Patterson AFB Base Comprehensive Plan, Contingency Component.